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Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
May 2, 1978. *Acting Commissioner of Patents and Trademarks.*

Registration to Practice

The following are names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before July 14, 1978.

LUTRELLE F. PARKER,
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REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,805,795, Re. S.N. 901,962, Filed May 1, 1978, Cl. 128/419 D, AUTOMATIC CARDIOVERTING CIRCUIT, Rollin H. Denniston III, et al., Owner of Record: *Medtronic, Inc., Minneapolis, Minn.*, Attorney or Agent: Harry W. Barron, Ex. Gp.: 335

3,805,795, Re. S.N. 901,963, Filed May 1, 1978, Cl. 128/419 D, AUTOMATIC CARDIOVERTING CIRCUIT, Mieczyslaw Mirowski, et al., Owner of Record: *Medtronic, Inc., Minneapolis, Minn.*, Attorney or Agent: Harry W. Barron, et al., Ex. Gp.: 335

3,806,558, Re. S.N. 901,400, Filed May 1, 1978, Cl. 260/897 A, DYNAMICALLY PARTIALLY CURED THERMOPLASTIC BLEND OF MONOOLEFIN COPOLYMER RUBBER AND POLYOLEFIN PLASTIC, William K. Fischer, Owner of Record: *Uniroyal, Inc., New York, N.Y.*, Attorney or Agent: James J. Long, Ex. Gp.: 142

3,864,309, Re. S.N. 899,765, Filed Apr. 24, 1978, Cl. 260/47 UA, COPOLYMER OF POLYIMIDE OLIGOMERS AND TEREPHTHALONITRILE N, N-DIOXIDE AND THEIR METHODS OF PREPARATION, Norman Bilow, et al., Owner of Record: *Hughes Aircraft Company, Culver City, Calif.*, Attorney or Agent: W. H. MacAllister, et al., Ex. Gp.: 143

3,875,441, Re. S.N. 901,975, Filed May 1, 1978, Cl. 313/104, ELECTRON DISCHARGE DEVICE INCLUDING AN ELECTRON EMISSIVE ELECTRODE HAVING AN UNDULATING CROSS-SECTIONAL CONTOUR, Richard Dale Faulkner, Owner of Record: *RCA Corporation, Princeton, N.J.*, Attorney or Agent: E. M. Whitacre, Ex. Gp.: 252

3,890,420, Re. S.N. 900,337, Filed Apr. 26, 1978, Cl. 264/261, METHOD OF MAKING A BIPOLAR ELECTRODE STRUCTURE, Theodore C. Neward, Owner of Record: *Inventor,* Attorney or Agent: John B. Young, et al., Ex. Gp.: 147

3,918,522, Re. S.N. 901,017, Filed Apr. 27, 1978, Cl. 166/285, WELL COMPLETION METHOD AND SYSTEM, George O. Suman, Jr., Owner of Record: *Inventor,* Attorney or Agent: W. F. Hyer, et al., Ex. Gp.: 354

3,922,873, Re. S.N. 901,967, Filed May 1, 1978, Cl. 62/84, HIGH TEMPERATURE HEAT RECOVERY IN REFRIGERATION, Louis H. Leonard, Owner of Record: *Carrier Corporation, Syracuse, N.Y.,* Attorney or Agent: J. Raymond Curtin, Ex. Gp.: 344

3,956,826, Re. S.N. 902,304, Filed May 1, 1978, Cl. 32/58, ULTRASONIC DEVICE AND METHOD, Rene J. Perdreaux, Jr., Owner of Record: *Cavitron Corporation, New York, N.Y.,* Attorney or Agent: Robert M. Skolnik, Ex. Gp.: 333

3,957,525, Re. S.N. 902,767, Filed May 2, 1978, Cl. 106/288 B, ROAD SURFACING MATERIALS, Geoffrey Lees, et al., Owner of Record: *Inventors,* Attorney or Agent: Davidson C. Miller, et al., Ex. Gp.: 113

4,007,721, Re. S.N. 897,659, Filed Apr. 17, 1978, Cl. 123/134, FUEL METERING APPARATUS FOR A CARBURETOR, Jose F. Regueiro, Owner of Record: *Teledyne Industries, Inc., Los Angeles, Calif.,* Attorney or Agent: Ernest I. Gifford, et al., Ex. Gp.: 342

4,025,312, Re. S.N. 899,949, Filed Apr. 25, 1978, Cl. 23/259.5, APPARATUS FOR MAKING CARBON BLACK, Eulas W. Henderson, Owner of Record: *Phillips Petroleum Company, Bartlesville, Okla.,* Attorney or Agent: Donald J. Quigg, Ex. Gp.: 171

4,028,103, Re. S.N. 901,969, Filed May 1, 1978, Cl. 96/29 D, PROCESSING COMPOSITIONS FOR COLOR TRANSFER PROCESSES COMPRISING ALKALI METAL FLUORIDES, David Eugene Hannie, Owner of Record: *Eastman Kodak Company, Rochester, N.Y.,* Attorney or Agent: Harold E. Cole, Ex. Gp.: 166

4,029,025, Re. S.N. 880,989, Filed Feb. 24, 1978, Cl. 108/108, SHELVING STRUCTURE, Harald Lundqvist, Owner of Record: *Inventor,* Attorney or Agent: Alan E. Kopecki, Ex. Gp.: 355

4,031,981, Re. S.N. 903,361, Filed May 5, 1978, Cl. 182/153, FOLDABLE WORK PLATFORM, Edward Spencer, et al., Owner of Record: *Little Giant Industries, Inc., Salt Lake City, Utah,* Attorney or Agent: H. Ross Workman, et al., Ex. Gp.: 354

4,058,899, Re. S.N. 878,553, Filed Feb. 16, 1978, Cl. 33/26, DEVICE FOR FORMING REFERENCE AXES ON AN IMAGE SENSOR ARRAY PACKAGE, William S. Phy, Owner of Record: *Fairchild Camera and Instrument Corporation, Mountain View, Calif.,* Attorney or Agent: Alan H. MacPherson, et al., Ex. Gp.: 243

4,068,798, Re. S.N. 898,445, Filed Apr. 20, 1978, Cl. 233/26, METHOD AND APPARATUS FOR STOPPER REMOVAL, Vernon Carl Rohde, Owner of Record: *E. I. Du Pont de Nemours & Co., Wilmington, Del.,* Attorney or Agent: Charles A. Weigel, Jr., Ex. Gp.: 353

4,074,021, Re. S.N. 901,018, Filed Apr. 27, 1978, Cl. 429/51, HIGH DISCHARGE BATTERY WITH DEPOLARIZED PLATES, Robert R. Aronson, Owner of Record: *Electric Fuel Propulsion Corp., Detroit, Mich.,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 114

4,078,107, Re. S.N. 903,356, Filed May 3, 1978, Cl. 428/356, LIGHTWEIGHT WINDOW WITH HEATING CIRCUIT AND ANTI-STATIC CIRCUIT AND A METHOD FOR ITS PREPARATION, Michael G. Bitterice, et al., Owner of Record: *PPG Industries, Inc., Pittsburgh, Pa.,* Attorney or Agent: Edward I. Mates, Ex. Gp.: 164

4,085,074, Re. S.N. 903,234, Filed May 5, 1978, Cl. 260/17 R, A PRE-MIXED CATALYZED VINYL ACETATE POLYMER ADHESIVE COMPOSITION, Ming Cho Woo, Owner of Record: *National Casein, Riverton, N.J.,* Attorney or Agent: Max R. Millman, Ex. Gp.: 143

PATENT NOTICES

Certificates of Correction for the Week of June 27, 1978

P.P. 4,102	4,053,423	4,067,919	4,073,745
Re. 27,897	4,053,966	4,068,366	4,073,837
Re. 29,467	4,055,783	4,068,634	4,073,935
Re. 29,477	4,055,921	4,068,669	4,074,024
D. 247,430	4,056,483	4,068,762	4,074,025
3,526,288	4,056,488	4,068,913	4,074,113
3,823,704	4,057,268	4,069,043	4,074,504
3,825,648	4,057,408	4,069,093	4,074,722
3,917,308	4,057,481	4,069,170	4,074,972
3,917,485	4,058,365	4,069,318	4,074,998
3,948,930	4,058,511	4,069,376	4,075,225
3,950,298	4,059,156	4,069,455	4,075,235
3,957,682	4,059,679	4,069,555	4,075,244
3,966,333	4,060,129	4,069,594	4,075,308
3,996,733	4,060,421	4,069,684	4,075,361
3,996,855	4,060,555	4,070,144	4,075,375
3,997,123	4,060,794	4,070,198	4,075,433
3,997,466	4,062,048	4,070,314	4,075,568
3,997,647	4,062,157	4,070,438	4,075,757
3,997,859	4,062,302	4,070,452	4,075,807
3,997,963	4,062,953	4,070,475	4,075,808
3,998,958	4,063,151	4,070,515	4,075,909
4,000,148	4,063,392	4,070,560	4,075,949
4,000,347	4,063,441	4,070,594	4,075,950
4,004,861	4,063,677	4,070,626	4,076,052
4,005,349	4,064,119	4,070,629	4,076,111
4,009,268	4,064,237	4,070,637	4,076,120
4,009,377	4,064,452	4,070,729	4,076,197
4,010,262	4,064,648	4,070,996	4,076,392
4,015,084	4,065,165	4,071,216	4,076,509
4,016,280	4,065,313	4,071,383	4,076,549
4,017,832	4,065,320	4,071,457	4,076,757
4,026,854	4,065,666	4,071,598	4,076,865
4,030,805	4,065,713	4,071,667	4,077,053
4,030,830	4,066,290	4,072,002	4,077,311
4,031,023	4,066,433	4,072,051	4,077,414
4,031,256	4,066,700	4,072,071	4,077,768
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4,035,930	4,066,702	4,072,182	4,078,009
4,037,435	4,066,789	4,072,389	4,078,143
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4,040,113	4,066,879	4,072,762	4,078,411
4,040,495	4,066,948	4,072,765	4,078,755
4,042,810	4,066,963	4,072,778	4,078,902
4,045,443	4,067,002	4,072,903	4,079,006
4,045,474	4,067,199	4,073,134	4,079,071
4,046,600	4,067,203	4,073,235	4,079,127
4,048,194	4,067,362	4,073,371	4,079,133
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4,049,358	4,067,709	4,073,558	
4,052,345	4,067,732	4,073,704	

Dedications

Reissue No. 28,317.—*John J. Goodrich*, Pensacola, Fla. GUSSETED TYPE BAGS. Patent dated Jan. 28, 1975. Dedication filed May 8, 1978, by the assignee, *St. Regis Paper Company.*

Hereby dedicates to the Public the remaining term of said patent.

Reissue No. 28,318.—*John J. Goodrich*, Pensacola, Fla. GUSSETED TYPE BAGS. Patent dated Jan. 28, 1975. Dedication filed May 8, 1978, by the assignee, *St. Regis Paper Company.*

Hereby dedicates to the Public the remaining term of said patent.

3,827,262.—*Malcolm O. Manuel*, Stanton, Minn. SPRAY WASHING SYSTEM FOR GARMENTS. Patent dated Aug. 6, 1974. Dedication filed May 10, 1978, by the assignees, *Ludell Mfg. Co., Inc. and American Linen Supply Co.*

Hereby dedicate to the Public the entire remaining term of said patent.

Disclaimers

3,994,415.—*Alan M. Hodge*, San Diego, Calif. TRASH CONTAINER LID SYSTEM. Patent dated Nov. 30, 1976. Disclaimer filed Apr. 24, 1978, by the inventor.

The term subsequent to Dec. 13, 1994 has been disclaimed.

4,061,297.—*George B. Foster*, Worthington, Ohio. APPROACH RANGE MONITOR. Patent dated Dec. 6, 1977. Disclaimer filed Mar. 22, 1978, by the assignee, *Air Data Corporation.*

The term subsequent to Mar. 6, 1994 has been disclaimed.

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D. 240,772. JACKET OR SIMILAR ARTICLE. Jerome Williams, 385 Linoleum Way, Pittsburgh, Pa. 15219.

3,680,237. OUT-DOOR ILLUMINATED SIGN. John G. Finnerty, 251 De Grand Ave., Teaneck, N.J. 07666.

3,953,983. REFRIGERATION METHOD AND REFRIGERATION APPARATUS FOR CARRYING OUT THE METHOD. Ernst Sander, Correspondence to: Craig & Antonelli, 909 Watergate Office Bldg., 2600 Virginia Ave. NW., Washington, D.C. 20037.

4,044,476. EDUCATIONAL METHODS AND DEVICES. Jeanette B Marsh, 1400 North Lake Shore Drive, 14–M, Chicago, Ill. 60610.

4,064,880. SANITARY TUBULAR NAPKIN FOR MALES. Dexter J. Logan, P.O. Box 1012, West Covina, Calif. 91793.

4,076,201. ADJUSTABLE CHAIR SPINDLE ASSEMBLY. Walter E. Hudnall, 2157 W. 236th Place, Torrance, Calif. 90501.

The following two patents are offered by John O. Richards, 980 Mill Circle, Apt. #99, Alliance, Ohio 44601.

3,835,507. ROPE HOLDING DEVICE.

3,578,840. REVOLVING REFLECTOR.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

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Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW.
Washington, D.C. 20324

Patent application 871,067. Adding Frequency Agility to Fire-Control Radars. Filed Jan. 20, 1978.

Patent application 871,866. Improved Fabry-Perot Diplexer. Filed Jan. 24, 1978.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

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Patent application 858,873. Wide Field-of-View Michelson Filter. Filed Dec. 8, 1977.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—
Code GP–2, Washington, D.C. 20546

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Patent application 860,404. A Speed Control Device for a Heavy Duty Shaft. Filed Dec. 13, 1977.

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Patent 3,600,599. Shunt Regulation Electric Power System. Filed Oct. 3, 1968. Patented Aug. 17, 1971. Not available NTIS.

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U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St., SW.
Washington, D.C. 20324

Patent application 861,083. Improved Tapered Hole Capacitive Probe. Filed Dec. 15, 1977.

Patent Application 865,270. Roll Attitude Feedback Selector for Use With Aircraft Control Augmentation Systems. Filed Dec. 28, 1977.

Patent application 871,066. High Power Pre-TR Switch. Filed Jan. 20, 1978.

Patent application 871,069. Bimetallic Lightweight Platelet Injector. Filed Jan. 20, 1978.

Patent application 872,193. All-Aluminum Transverse Platelet Injector. Filed Jan. 25, 1978.

Patent application 872,203. Wideband Waveguide Lens. Filed Jan. 25, 1978.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements & Patent Branch, General Services Div., Federal Building. Agricultural Research Service
Hyattsville, Md. 20782

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Building, Bethesda, Md. 20014

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U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—
Code 302, Arlington, Va. 22217

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Patent application 854,455. Analog-to-Digital Converter. Filed Nov. 23, 1977.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters NASA—
Code GP–2, Washington, D.C. 20546

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Patent application 861,396. A Versatile LDV Burst Simulator. Filed Dec. 16, 1977.

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Patent 3,543,839. Multi-Chamber Controllable Heat Pipe. Filed May 14, 1969. Patented Dec. 1, 1970. Not available NTIS.

Patent 3,573,504. Temperature Compensated Current Source. Filed Jan. 16, 1968. Patented Apr. 6, 1971. Not available NTIS.

Patent 3,641,470. Pressure Transducer. Filed Sept. 18, 1969. Patented Feb. 8, 1972. Not available NTIS.

Patent 3,769,544. Purging Means and Method for Xenon Arc Lamps. Filed June 19, 1972. Patented Oct. 30, 1973. Not available NTIS.

Patent 3,882,417. Gas Ion Laser Construction for Electrically Isolating the Pressure Gauge Thereof. Filed Sept. 10, 1973. Patented May 6, 1975. Not available NTIS.

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Patent 4,064,566. Method of Adhering Bone to a Rigid Substrate Using a Graphite Fiber Reinforced Bone Cement. Filed Apr. 6, 1976. Patented Dec. 27, 1977. Not available NTIS.

Patent 4,064,642. Walking Boot Assembly. Filed Dec. 23, 1976. Patented Dec. 27, 1977. Not available NTIS.

Patent 4,065,202. Projection System for Display of Parallax and Perspective. Filed Nov. 6, 1975. Patented Dec. 27, 1977. Not available NTIS.

Patent 4,065,340. Composite Lamination Method. Filed Apr. 28, 1977. Patented Dec. 27, 1977. Not available NTIS.

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Patent 4,067,015. System and Method for Tracking a Signal Source. Filed July 11, 1975. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,067,043. Optical Conversion Method. Filed Jan. 21, 1976. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,067,742. Thermal Shock and Erosion Resistant Tantalum Carbide Ceramic Material. Filed Apr. 1, 1976. Patented Jan. 10, 1978. Not available NTIS.

Patent 4,068,469. Variable Thrust Nozzle for Quiet Turbofan Engine and Method of Operating Same. Filed May 29, 1975. Patented Jan. 17, 1978. Not available NTIS.

Patent 4,068,470. Gas Turbine Engine With Convertible Accessories. Filed Nov. 8, 1974. Patented Jan. 17, 1978. Not available NTIS.

Patent 4,069,028. Magnetic Heat Pumping. Filed Nov. 30, 1976. Patented Jan. 17, 1978. Not available NTIS.

Patent 4,069,212. Flame Retardant Spandex Type Polyurethanes. Filed Feb. 13, 1976. Patented Jan. 17, 1978. Not available NTIS.

Patent 4,069,478. Binary to Binary Coded Decimal Converter. Filed Nov. 12, 1975. Patented Jan. 17, 1978. Not available NTIS.

Inco Limited, Inco United States, Inc. and ESB Incorporated: Patents Available for Licensing

Inco Limited, Inco United States, Inc. and ESB Incorporated will grant or cause to be granted to any person making written application therefor licenses of the following patents and applications, and of know-how related to the controlled microgeometry ("CMG") process of forming, perforating and activating metallic foil and constructing battery electrodes therefrom.

U.S. Pat. No.	Corresponding foreign patent and patent application numbers: Country	Numbers
3,579,383 Patd. May 18, 1971	United Kingdom	1,227,379
	Belgium	736,965
	Canada	910,841
	France	69/24534
	West Germany	1,938,434
	Italy	884,439
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	Netherlands	143,736
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	Switzerland	500,596
3,785,867 Patd. Jan. 15, 1974	United Kingdom	1,246,048
	Australia	438,246
	Austria	298,589
	Belgium	749,327
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	France	70/14555
	India	126,204
	Italy	904,223
	Japan	789,196
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	Norway	134,443
	South Africa	70/2437
	Spain	378,877
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3,837,919 Patd. Sep. 24, 1974	United Kingdom	1,398,080
	Australia	469,150
	Austria	317,324
	Belgium	790,585
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	Denmark	134,375
	France	72/37908
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3,852,112 Patd. Dec. 3, 1974	United Kingdom	1,240,445
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	Australia	461,756
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	Spain	431,855
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	Country	Numbers
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	Switzerland	*14985/74
715,534* (Abandoned.) Patd. Aug. 18, 1976	Belgium	845,558
	Luxembourg	75661
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789,689* (Cont. of 715,534*.) Patd. Apr. 21, 1977	Denmark	*3831/76
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	Norway	*76/2904
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	Switzerland	*10793/76
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747,055* Patd. Dec. 3, 1976	Canada	*267,245
	United Kingdom	*50478/75
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	Luxembourg	[1]
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Not now filed in U.S.	United Kingdom [2]	*29423/76
Not now filed in U.S.	United Kingdom [3]	*32287/76

*Represents patent applications.
[1] Represents patents (or patent applications) whose numbers are not yet known.
[2] Filed Jul. 15, 1976; abandoned.
[3] Filed Aug. 3, 1976; abandoned.

Licensees will also be granted certain immunities from suit with respect to other patents. CMG know-how will be furnished to know-how licensees in a written manual available at a cost of $1,000.

Any interested party shall have the right to inspect and make copies of any of the aforelisted U.S. patent applications.

Such patent and know-how licenses, immunities and manual are available on the terms set forth in paragraphs IV (A) and (B) of the final judgment entered on Jan. 27, 1978, in Civil Action No. 76-152 by the U.S. District Court for the Eastern District of Pennsylvania. Requests for the foregoing licenses, immunities or written manual should be addressed in writing to one of the following:

E. C. MacQueen, Esq.
Inco Limited
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New York, N.Y. 10004

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New York, N.Y. 10004

A. J. Rossi, Esq.
ESB Incorporated
5 Penn Center Plaza
Philadelphia, Pa. 19103

DYER S. WADSWORTH
Chief Legal Officer and Secretary
Inco United States, Inc.
For and on behalf of
Inco Limited
Inco United States, Inc.
ESB Incorporated

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 20, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-22-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-11-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-1-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-5-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	2-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-17-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-9-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-3-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-7-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-26-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-10-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors: Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-3-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-20-77

Expiration of patents: The patents within the range of numbers indicated below expire during May 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,981,954 to 2,986,736, inclusive
Plant Patents..... Numbers 2,055 to 2,066, inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,678

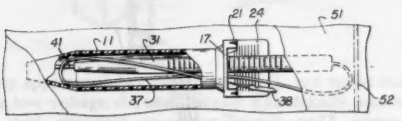
CAUTERIZING INSTRUMENT AND HOLDER

Frank P. Antonini, San Francisco, and Julien I. Schwalbe, Oakland, both of Calif.

Original No. 3,934,715, dated Jan. 27, 1976, Ser. No. 471,197, May 20, 1974. Application for reissue Aug. 2, 1976, Ser. No. 710,410

Int. Cl.[2] **B65D** *69/00, 81/24*

U.S. Cl. 206—571 **4 Claims**



1. A kit for an electro-surgical cauterizing instrument comprising a hollow handle, an electrode insertable in and removable from said handle, an electrical fitting in said handle, said handle having electrical contacts in its interior to establish electrical connection with said electrode when said electrode is inserted in said handle, an elongated [core] *cord* connected to said contacts inside said handle and extending out one end of said handle, a terminal on the end of said cord remote from said handle for electrical connection to a cauterizing machine, a holder formed with a sheath to receive said electrode and handle and having one closed end, said handle with said electrode inserted therein being insertable in and removable from said holder and said electrode being protected from electrical and germ contact with the exterior when inserted in said holder, said holder being substantially larger than said handle, a flange on the open end of said sheath opposite said closed end, said flange formed with means for attachment of said holder to a surgical drape, and an envelope to maintain said handle, electrode and holder sterile until said envelope is opened, said electrode being inserted into said handle and electrically connected to said contacts, said electrode and the end of said handle adjacent said electrode being positioned inside said sheath, most of said cord being inside said sheath, said terminal being exposed immediately outside said sheath, said envelope enclosing the assembly of holder, handle, [core] *cord* and terminal.

Re. 29,679

STEM SEALING FOR HIGH PRESSURE VALVE OR THE LIKE

Boyd D. Boitnott, Jasper, Ark., assignor to Gray Tool Company, Houston, Tex.

Original No. 3,990,679, dated Nov. 9, 1976, Ser. No. 560,237, Mar. 20, 1975. Application for reissue Sep. 15, 1977, Ser. No. 833,605

Int. Cl. F16k *31/44*

U.S. Cl. 251—214 **16 Claims**

1. Apparatus comprising:

a. a body having a cavity adapted to contain a fluid under high pressure,

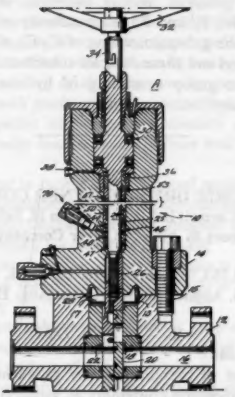
b. an operative element for functioning within said cavity, in response to the rotation of a shaft,

c. a shaft extending through said body from said cavity to a region outside said body of relatively low pressure,

d. means for providing a seal between said shaft and said body between said cavity and said region, said means including a plurality of sealing elements which are successively disposed between the relatively high and low pressure regions and sealing between said shaft and said body each having a side thereof toward said cavity and a side thereof opposite said cavity, [and]

e. a plurality of chambers, each in communication with the side of one sealing element nearest the region and the side of the adjacent sealing element nearest the cavity, and

[e.] *f.* means for ensuring that the differential pressure on each of said sealing elements is not greater than a predetermined amount and that [to] *no* sealing element differential pressure is as large as the pressure differential between



said cavity and said low-pressure region[.], *said means including means for providing flowable plastic material under pressure in each of said chambers decreasing from said high pressure bore to said region comprising a floating piston having one face thereof exposed to the pressure of fluid within said cavity, and having the other face thereof bearing on flowable plastic material in a channel in fluid communication with each of said chambers, and a differential back-pressure valve operatively associated with each of said chambers.*

Re. 29,680

REGENERATION OF ANION EXCHANGE RESINS

Eli Salem, Brooklyn, N.Y.; Donald J. Butterworth, Lyndhurst, and Leo F. Ryan, Sommerville, both of N.J., assignors to Ecodyne Corp., Chicago, Ill.

Original No. 3,645,921, dated Feb. 29, 1972, Ser. No. 30,058, Apr. 20, 1970. Application for reissue Nov. 29, 1972, Ser. No. 310,383

Int. Cl.[2] **C08J** *5/20*

U.S. Cl. 260—2.1 R **11 Claims**

1. A method for converting strong-base anion exchange resin having quaternary ammonium active groups from the monovalent anion form to the hydroxide form comprising: passing a [solution] *source* of polyvalent anions through a first batch of said resin, whereby to displace said monovalent anions [with said polyvalent anions]; subsequently passing a solution of alkali metal hydroxide through said resin to convert said resin to the hydroxide form, and to produce an effluent solution of hydroxide anions and [divalent] *polyvalent* anions; neutralizing said effluent with an acid containing *a source of* polyvalent anions whereby to form a neutralized [solution] *source* of polyvalent anions; and passing said neutralized [solution] *source of polyvalent anions* through a second batch of said resin in the monovalent anion form.

Re. 29,681
METAL SALTS OF 1,1,5,5-TETRASUBSTITUTED DITHIOBIURETS

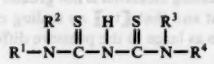
William R. Diveley, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Original No. 3,950,366, dated Apr. 13, 1976, Ser. No. 359,164, May 10, 1973. Application for reissue Jan. 12, 1977, Ser. No. 758,614

Int. Cl.[2] C07F *3/06*

U.S. Cl. 260—429.9 7 Claims

1. A metal salt of a 1,1,5,5-tetrasubstituted dithiobiuret of the formula:



in which R^1, R^2, R^3 and R^4 independently of each other are selected from the group consisting of C_1-C_{18} alkyl, C_5-C_{12} aryl, C_3-C_{12} cycloakyl and these radicals substituted by at least one member of the group consisting of hydroxyl, C_1-C_4 alkyl, C_1-C_8 [aryl] *acyl,* halo and nitro.

Re. 29,682
LOW CALORIE DRY SWEETENER COMPOSITION

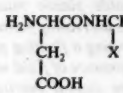
John A. Cella, Carmel, Ind., and William H. Schmitt, Brandford, Conn., assignors to Alberto-Culver Company, Melrose Park, Ill.

Original No. 3,753,739, dated Aug. 21, 1973, Ser. No. 87,303, Nov. 5, 1970. Application for reissue Aug. 19, 1974, Ser. No. 498,298

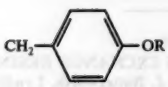
Int. Cl.[2] A23L *1/26*

U.S. Cl. 426—548 8 Claims

1. A method of preparing a dry pulverulent low calorie sweetener composition containing an aspartyl dipeptide lower alkyl ester of the formula



wherein X is selected from the group of radicals consisting of



and

$(CH_2)_n S(O)_m$(lower alkyl)

R being a member of the group consisting of hydrogen and a lower alkyl radical, m an integer selected from the group consisting of 0 and 2 and n a positive integer less that three, which comprises

a. preparing an aqueous starch hydrolysate solution having a D.E. up to 20 and having a temperature of about 30° to about 80° C,

b. preparing a substantially concentrated aqueous solution or slurry of said ester having a temperature in the range up to about 40° C,

c. admixing a minor proportion of the b. solution or slurry with a major proportion of the a. solution, and

d. promptly drying the c. mixture to provide a dry pulverulent composition containing from 0.5 to 10 percent, by weight, of said ester, and not more than about 4 percent moisture.

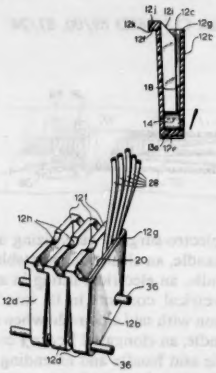
Re. 29,683
ENCAPSULATION HOUSING FOR ELECTRONIC CIRCUIT BOARDS OR THE LIKE AND METHOD OF ENCAPSULATING

Alfred Ocken, Jr., Franklin Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Original No. 3,869,563, dated Mar. 4, 1975, Ser. No. 401,471, Sep. 27, 1973. Application for reissue Feb. 28, 1977, Ser. No. 773,081

Int. Cl.[2] H05K *5/06;* B29C *6/02*

U.S. Cl. 174—52 PE 22 Claims



21. An improved protective enclosure for encapsulating an electrical control circuit and heat sink in a circuit board assembly, comprising a housing structure formed with a base, vertical sidewalls and front and back end walls, open at the top; positioning means to position the heat sink flatly against one end wall; said housing further including a ledge extending laterally and outwardly from the top of one end wall, said ledge having a bottom edge, said other end wall having a top edge, the height of the bottom edge of said ledge above said base in relation to the height of the top edge of the other end wall above said base being dimensioned such that said housing is adaptable for stacking in multiple units in a vertical, side by side relation whereby said laterally extending ledge of one housing overlies the top edge of the next adjacent housing.

22. An improved method of encapsulating a control device and heat sink in a circuit board assembly comprising the steps of:

forming a housing having a base, upstanding front and back end walls and side walls, open at its top, inserting the circuit board assembly into the housing, positioning the heat sink of the circuit board assembly within the housing flatly against one of the end walls and pouring encapsulating material into the housing in an amount sufficient to cover the control device assembled on the circuit board.

Re. 29,684
WELDING HELMET WITH EYE PIECE CONTROL

Mack Gordon, 29085 Solon Rd., Cleveland, Ohio 44139

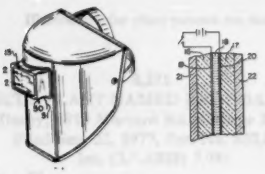
Original No. 3,873,804, dated Mar. 25, 1975, Ser. No. 427,988, Dec. 26, 1973. Continuation-in-part of Ser. No. 244,180, Apr. 14, 1972, abandoned. Application for reissue Jun. 3, 1976, Ser. No. 692,295

Int. Cl.[2] B23K *9/32*

U.S. Cl. 219—147 14 Claims

1. A protective welding lens assembly for use with an electrical welding machine having an electrical energizing circuit and having a welding electrode connected thereto by an electrical cable, said assembly being [planar and] fixedly mounted in a welder's helmet, and comprising a layer of liquid crystal material sandwiched between opposing parallel plates coated [over their entire area] with unbroken transparent conducting films, said films being pretreated by rubbing the

same in parallel lines at right angles to each other whereby to control their polarizing effect upon said liquid crystal material, said plates with the enclosed liquid crystal material being disposed between and parallel to a pair of conventional [cross] polarizers so arranged that when a suitable electrical potential is established across said conducting films and said liquid crystal layer the lens assembly will change [from a uniform] *its* light transmitting condition [to a uniform high



density approximately opaque condition], and means including a low voltage electrical circuit [electrically associated with said electrical energizing circuit and] responsive [solely] to [approach of] *establishment of an arc between* said welding electrode [to the] *and* work to be welded [by the wearer of the helmet] for applying said suitable electrical potential across said conducting films and said liquid crystal layer [in a period of approximately 1/500 of a second].

Re. 29,685

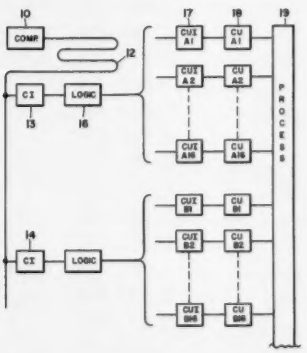
PROCESS CONTROL SYSTEM

Saleh A. Nabi, Sharon, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Original No. 3,760,374, dated Sep. 18, 1973, Ser. No. 241,546, Apr. 6, 1972. Application for reissue Aug. 14, 1975, Ser. No. 604,703

Int. Cl.[2] G06F *15/46*

U.S. Cl. 364—900 **35 Claims**



14. In a system for controlling a complex industrial process having a large number of different process conditions, said system comprising a plurality of closed-loop control units, each unit being for a respective process condition; said control units comprising analog controllers, said controllers including means for producing analog control signals to operate respective process devices which determine the magnitudes of corresponding process variables thereby to effect the desired control of the process conditions, said analog controllers being provided with analog set-point signals, indicating the value of the process condition to be established, and corresponding analog measurement signals indicating the actual value of the process conditions, said analog controllers including means for comparing the respective set-point signal with the corresponding analog measurement signal and developing from such comparison the required control signals for the respective process device to maintain each affected process condition at its set-point value;

said control system further comprising a central station with a digital computer which is supplied with information signals respecting the controlled process, including the values of selected process conditions, for producing from such information signals various instructional signals to be transmitted to equipment associated with said analog controllers for directing the functioning of the corresponding process devices in accordance with predetermined characteristics pre-set in the digital computer; said analog controllers and associated equipment being located remotely from said central station computer;

the improvement in such a process control system wherein said equipment associated with said analog controllers comprises:

at least one input/output subsystem assigned to a set of said analog controllers for operation therewith;

a cable extending from said digital computer to said input/output subsystem for carrying digital signals in both directions therebetween;

said input/output subsystem including a set of controller interfaces with each such interface being coupled to a respective controller of said set of analog controllers;

each of said controller interfaces including digital-to-analog converter means responsive to digital signals developed from instructional signals sent over said cable by said computer and representing instructional data for the corresponding analog controller, or the process device associated therewith;

said digital-to-analog converter means at each controller interface including output circuit means operable to produce an output analog signal corresponding to the applied digital signal and to direct such output analog signal to the analog controller corresponding to that controller interface, or to the process device associated with said analog controller, for effecting control of said associated process device;

memory means for each of said digital-to-analog converter means to store signals representing the instructional data directed to the respective converter means by said computer, said memory means being coupled to said corresponding analog controller or to said associated process device whereby such instructional data remains available for use by the corresponding analog controller or the associated process device while said computer is communicating with other of said controller interfaces or is performing other tasks; and

analog-to-digital converter means forming part of said input-/output subsystem for converting analog signals to corresponding digital signals to be sent through said cable to said digital computer.

PLANT PATENTS

GRANTED JUNE 27, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,271

HIBISCUS PLANT NAMED LADY BALTIMORE

Robert H. Darby, 4813 Harvard Rd., College Park, Md. 20740

Filed Sep. 22, 1977, Ser. No. 835,828
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive cultivar of hibiscus substantially as herein shown and described, a glowing pink-and-red bicolor of elegant form and substance, a plant of great landscape value, blooming profusely from midsummer to frost.

4,272

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 22, 1977, Ser. No. 835,829
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium;* Ramat, known by the cultivar name Yellow Sophisticate and particularly characterized as to uniqueness by the combined characteristics of daisy capitulum type; flat capitulum form; medium yellow ray floret color; yellow green (immature) to yellow (mature) disc floret color; diameter across face of capitulum from 85 to 90 mm. at maturity; uniform 9 week flowering response to photoperiodic short-day control; medium plant height; semi-spreading branching pattern; and minimal pollen development.

4,273

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 22, 1977, Ser. No. 835,830
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium;* Ramat, known by the cultivar name Jasmine and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form, reflexing slightly with age; spider capitulum type; medium yellow ray floret color; diameter across face of capitulum from 140 to 160 mm. at maturity; uniform 9 week flowering response to photoperiodic short-day control; medium plant height; and semi-spreading branching pattern.

PATENTS

GRANTED JUN. 27, 1978

ERRATA

For CLASS	See PATENT NO.
004–255	4,096,597
407–092	4,096,613
126–271	4,096,861
134–003	4,096,869
134–028	4,096,870
134–040	4,096,871
400–110	4,096,934
400–479	4,096,935
366–165	4,097,026
350–149	4,097,110
350–027	4,097,141
209–111.5	4,097,373
428–035	4,097,385
544–353	4,097,478
544–366	4,097,479
560–053	4,097,519
568–807	4,097,537
568–726	4,097,538
568–751	4,097,539
568–862	4,097,540
423–303	4,097,583
423–348	4,097,584
423–574 R	4,097,585
260–045.8 A	4,097,587
560–030	4,097,657
307–141	4,097,763
307–200 A	4,097,764
307–212	4,097,765
307–229	4,097,766
307–229	4,097,767
307–230	4,097,768
307–252 B	4,097,769
307–252 J	4,097,770
307–268	4,097,771
307–279	4,097,772
307–296 A	4,097,773
365–118	4,097,848

PATENTS

GRANTED JUNE 11, 1974

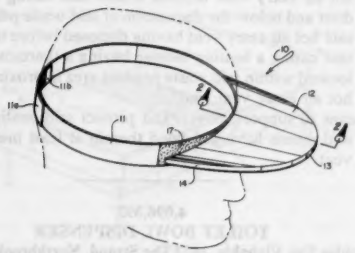
ERRATA

PATENTS

GRANTED JUNE 27, 1978

GENERAL AND MECHANICAL

4,096,589
ADJUSTABLE EYE SHADE
Morton I. Goldstein, Columbus, Ohio, assignor to Matrix Groups, Inc., Columbus, Ohio
Filed Jan. 7, 1977, Ser. No. 757,621
Int. Cl.[2] A61F 9/00
U.S. Cl. 2—12 **7 Claims**



1. An adjustable eye-shade comprising
a head band positionable in retained relationship on a person's head,
a visor element of flexible material forming an eye-shading panel, said panel having a peripheral edge which includes an inwardly curved portion that is adapted to cooperatively interfit with said headband, and
connecting means for selectively interconnecting said peripheral edge of said visor element to said headband, said connecting means being a two element structure wherein one of said elements includes a loop surface and the other a hook surface which are cooperatively interengageable for subsequent disengagement, one element of said connecting means fastened to said headband at an exteriorally facing surface thereof and the other element secured to the inwardly curved peripheral edge portion of said visor element.

4,096,590
COLLAPSIBLE HAT
Edward G. Keshock, 1625 Kingsway, Norfolk, Va. 24112
Filed Jun. 21, 1976, Ser. No. 697,708
Int. Cl.[2] A42B 1/20
U.S. Cl. 2—180 **4 Claims**

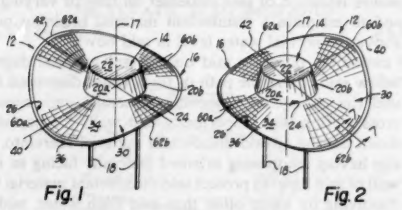
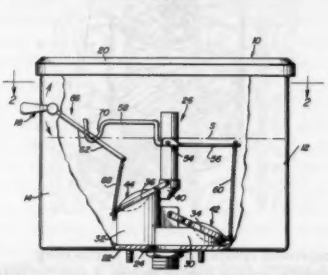


Fig. 1 Fig. 2

1. A hat having a snap brim assembly which is adjustable between two stable brim configurations, the brim assembly comprising a generally annular brim member and a spring member disposed circumferentially about a brim member and extending generally annularly about an axis, said brim member formed from a sheet of flexible bi-directional material whose tensile strength is maximum in first and second transverse directions and less than maximum in other directions, said spring member having a planar configuration prior to assembly with said brim member, said spring member having a circumferential length in excess of the unstressed circumferential length of said annular brim member, said members engaged and reacting with each other so that said spring member is resiliently deformed to one of two stable nonplanar configurations, one configuration characterized by a first pair of diametrical spring member locations aligned in one of said transverse directions and being displaced in a first axial direction from their planar configuration locations and a second pair of diametrical spring member locations aligned in the other transverse direction and being displaced from their planar configuration locations in a second axial direction opposite to said first axial direction, the other configuration characterized by each of said diametrical spring member locations being displaced from their planar configuration locations in the opposite direction from their first configuration displacements, said brim member being resiliently tensioned radially and circumferentially along its juncture with said spring member to maintain said spring member in each of said two nonplanar configurations.

4,096,591
DUAL FLUSH VALVE
Edward Adam Awis, 118 SW. 57th St., Cape Coral, Fla. 33904
Filed Jan. 12, 1977, Ser. No. 758,811
Int. Cl.[2] E03D 1/34
U.S. Cl. 4—326 **6 Claims**



1. A flush valve system for use in a flushing tank of a toilet, comprising, in combination:
(a) a pair of valve seats arranged at different levels in a liquid reservoir;
(b) a pair of valve elements, each mounted for blocking a respective one of the valve seats; and
(c) actuator means operating on the valve elements for causing the valve elements to unblock the valve seats independently of one another, the actuator means including in combination:
(1) a lever pivotally mounted on a pivot axis disposed between and above the valve seats, the lever having two oppositely directed arms each arranged for moving toward and away from an associated one of the valve seats, with one of the arms being connected to one of the valve elements for operating same and moving the valve element to a position unblocking the associated one of the valve seats; and
(2) a crank separate from and operable independently of the lever, the crank pivotally mounted on the liquid reservoir substantially coextensive with the lever, the crank and lever pivoting on parallel axes, and connected to the other of the valve elements for operating same in a first direction of rotation of the crank, the crank being arranged for selectively engaging the other of the arms of the lever in a second direction of rotation of the crank opposite to the first direction for pivoting the lever and causing the one of the valve elements to

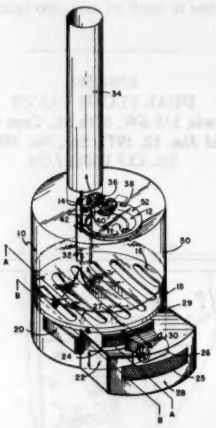
unblock the associated one of the valve seats wherein the other of the arms of the lever terminates in a U-shaped portion opening away from the valve seats and bent from the extent of the lever for engaging with the crank, the crank engaging the U-shaped portion in the second direction of rotation and pivoting the lever thereby for operating the one of the valve elements, and the crank moving away from and out of engagement with the U-shaped portion of the lever in the first direction of rotation while simultaneously operating the other of the valve elements and unblocking the other of the valve seats.

4,096,592

COMPOSTING TOILET

Alexander Clark, 115 Pleasant St., Brunswick, Me. 04011

Filed Jan. 5, 1977, Ser. No. 757,014
Int. Cl.[2] A41K *11/02*; C05F *3/04*
U.S. Cl. 4—111 **5 Claims**



1. An improved composting toilet comprising:

a substantially hollow casing having a substantially flat top and bottom and a front and rear, said casing's top having defined therein a waste entry aperture in proximity to the front of said casing and an air vent chimney aperture defined therein in proximity to the rear of said casing;

a lid member covering said waste entry aperture, said lid member being adapted to be manually opened in order to allow access to said waste entry aperture;

an air vent chimney positioned at said air vent chimney aperture;

a concave waste pile platform horizontally disposed intermedially within said hollow casing making contact around its perimeter with the interior of said hollow casing, said waste pile platform having defined therein a plurality of parallel elongated apertures running lengthwise in a front to back direction within said casing and further having defined therein an air bypass tube aperture positioned at a point directly below said air vent chimney, the hollow of said concavity of said waste pile platform facing said casing top;

an air bypass tube positioned at said air bypass tube aperture and extending upwards, its top being disposed at the bottom of said air vent chimney, said air bypass tube's cross-sectional area being smaller than the cross-sectional area of said air vent chimney, said air bypass tube adapted to allow air to pass into said air vent chimney from the area below said waste pile platform, said air vent chimney further having defined therein a cutaway section facing said casing's front beneath said casing's top;

a blower affixed beneath said casing top adapted to blow air up said air vent chimney thereby assisting in circulation of air within said casing;

a waste product area defined within said casing below said waste pile platform having positioned therein at least one removable container adapted to rest on said casing's bottom to catch waste products which may fall through said elongated apertures in said waste pile platform;

a door positioned in the side at the front base of said casing lower than the disposition of said waste pile platform within said casing, said door adapted to allow for the removal and reentry of said container for the purpose of emptying waste products from therein;

a hot air entry vent defined within said casing above said door and below the disposition of said waste pile platform, said hot air entry vent having disposed before it outside of said casing a heating blower having a thermostat control located within said waste product area in proximity to said hot air entry vent; and

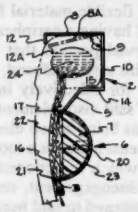
means to support, cover, and protect said heating blower, said means having defined therein at least one air intake vent.

4,096,593

TOILET BOWL DISPENSER

Eftichios Van Vlahakis, 2423 The Strand, Northbrook, Ill. 60062

Filed Jul. 15, 1976, Ser. No. 705,598
Int. Cl.[2] E03D *9/02*; A61L *9/04*
U.S. Cl. 4—231 **6 Claims**



1. An improved toilet bowl dispenser comprising in operative combination:

(a) means for removably retaining said dispenser on the inner rim of a toilet bowl comprising a clip-on member having a top member, a bottom member, a generally vertical wall member joining said top and said bottom, lateral retaining means depending from said top member, said top member being disposed at an acute angle to said wall member to provide positive vertical clamping action to said rim between said top and bottom members for universal fit and secure retention of said dispenser on rims of varying size and to maintain a disinfectant material retaining means above the normal water level in said bowl;

(b) means for retaining said disinfectant material disposed below said rim in the path of flush water dispensed from said rim comprising a member generally cup-shaped in cross section with imperforate end walls for permitting direct casting of said disinfectant material thereinto, said cup having an opening oriented generally facing an inner wall of said bowl to protect said disinfectant material from dissolving by water other than said flush water, said cup having an upper edge portion spaced from said inner wall of said bowl to provide space for flush water to flow downwardly into contact with said disinfectant material disposed in said cup, and a lower portion of said cup including means extending into contact with said bowl inner wall to space said upper edge portion from said wall and for detaining the downward flow of water into said bowl to provide even dissolution of said disinfectant material along its length; and

(c) means for urging said disinfectant-retaining cup means against said inner wall of said toilet bowl, said urging

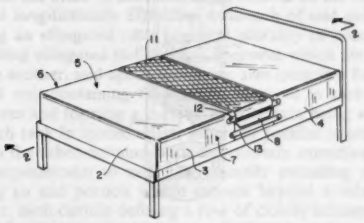
means connecting said cup means and said removable retaining means.

4,096,594

MATTRESS DEVICE

Raymond A. St. Jean, West Warwick, R.I., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Dec. 30, 1976, Ser. No. 755,800
Int. Cl.[2] A61G 7/02
U.S. Cl. 5—90 2 Claims



1. A mattress device for preventing discomfort to a bedwetter using a mattress, said mattress device comprising

a channel formed through a mattress to provide a pair of spaced mattresses, which, together with the channel, form a mattress having a top and sides;

a pan removably positioned in the channel for collecting liquids, said pan being positioned at a pitch in a manner whereby liquids collected therein flow toward a predetermined point at the bottom of the pan;

a hose having one end coupled to the predetermined point at the bottom of the pan for draining liquids in the pan therefrom;

mesh material covering the channel at the top of the mattress for supporting a person on the mattress over the channel and permitting liquid to flow therethrough; and

fastening means for fastening the pair of mattresses to each other with the channel between them.

4,096,595

MATTRESSES AND METHOD FOR PRODUCING MATTRESSES

Richard H. Eide, Minneapolis, and Gerald A. Golembeck, Lake Elmo, both of Minn., assignors to The United States Bedding Company, St. Paul, Minn.

Division of Ser. No. 729,386, Oct. 4, 1976, Pat. No. 4,051,644.
This application May 12, 1977, Ser. No. 796,075
Int. Cl.[2] A47C 27/00; B65B 63/02
U.S. Cl. 5—345 R 2 Claims

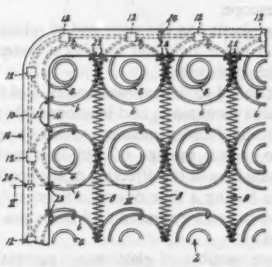
1. In a method for filling a flexible cover with a resilient filler for the formation of mattresses or the like, said method including providing a hopper comprising upper and lower sections defining a filler receiving space and an open end, said cover being dimensioned for attachment to the hopper whereby the interior of the cover communicates with said open end of the hopper, and including the step of driving said filler into said cover, the improvement comprising the steps of locating a dispensing means in association with each section of said hopper in positions such that opposite surfaces of the filler are located adjacent said dispensing means when the filler is in the hopper, providing a supply for adhesive for said dispensing means, and operating said dispensing means while moving the filler into the cover whereby adhesive is deposited on the filler surfaces for contact with opposed cover surfaces to securely fasten the cover to the filler, and including the steps of driving the filler into said cover by providing spaced-apart pusher means, and pressing said pusher means into position adjacent respective hopper surfaces whereby said pusher means engage opposite edge portions of the filler at one end of the filler.

4,096,596

FURNITURE DECK EDGING

George R. Pearson, High Point, N.C., assignor to Flex-O-Lators, Inc., Carthage, Mo.

Filed Feb. 9, 1977, Ser. No. 767,127
Int. Cl.[2] A47C 25/00
U.S. Cl. 5—360 4 Claims



1. In combination with a furniture deck having a top load-supporting surface and a border member extending along and attached to the marginal edge of said load-supporting surface, and edging strip comprising:

a. an elongated body portion extending along and overlying said border member and the marginal edge portion of said deck, and being formed of a padding material,

b. a first longitudinal fin integral with said body portion adjacent the horizontally outward edge thereof and at the bottom surface thereof and being inclined downwardly and inwardly from said body portion toward the horizontally inward edge of said body portion, whereby a groove is formed between said fin and said body portion, said border member being engaged in said groove,

c. a second longitudinal fin integral with said body portion at the horizontally inward edge thereof, in transversely spaced relation from said first fin, said body portion and said first and second fins of said strip being of one-piece construction of a resilient, porous material of chemically homogenous nature throughout their entire volumes, with gas-filled cells distributed therein, the material forming said fins being densified by a reduction of the volume of the gas-filled cells therein, whereby to be rendered relatively stiff and tough as compared to said body portion, and

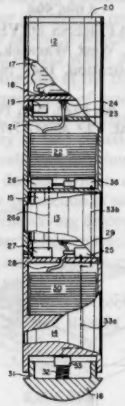
d. fastener means securing said second fin to elements of said deck, whereby horizontally outward movement of said strip relative to said deck is prevented, and said first fin is secured in engagement with said border member.

4,096,597
DRAIN OPENING DEVICE
Gregory E. Duse, 7024 Hamilton Ave., Pittsburgh, Pa. 15208
Filed Sep. 30, 1976, Ser. No. 728,249
Int. Cl.[2] E03D *11/00*; B65D *5/72, 35/38*
U.S. Cl. 4—255 1 Claim

1. An apparatus for opening clogged drains comprising:
(a) an upper tube having one closed end and one open end;
(b) a lower tube fitted coaxially within said upper tube to freely telescope;
(c) a flexible plastic bag the open end of which is attached within said lower tube and forming a watertight cavity within said upper tube;
(d) a base attached to the exposed end of said lower tube;
(e) a flap valve mounted in said base openable resiliently in response to fluid under pressure exerted on opposite sides thereof to permit passage of said fluid under pressure through said base in the direction of the applied pressure,
(f) said base having a face normal to the axis of the said coaxial tubes and a recess in said face open to said flap valve; and
(g) a separate member of elastomeric material removably fitted into said recess and having a face sloped at an angle of 10° to 20° to the face of said base.

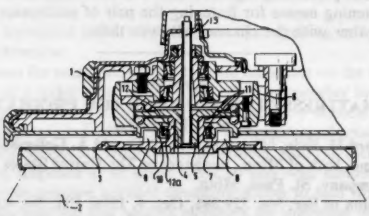
4,096,598
SELECTED DEPTH MOORING SYSTEM
Russell I. Mason, 30 Kensington Rd., Glen Falls, N.Y. 12801
Filed Mar. 21, 1977, Ser. No. 779,740
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 R 10 Claims

1. A selected depth mooring system for use at sea of any bottom depth, comprising, in combination:
flotation means deployable on the surface of the sea;
mooring means including buoyant submersible means releasably coupled to said flotation means and deployable to a selected depth relative to the surface, anchor means releasably coupled to said submersible means and deployable to the bottom of the sea, first cable means operatively connected between said submersible means and said anchor means for payout to a length equal to the distance from the selected depth to the bottom, the combined weight in water of said anchor means and said first cable means being greater than the buoyant force of said submersible means; and
second cable means operatively connected between said flotation means and said mooring means for payout to a length equal to the selected depth, the combined weight in



water of said mooring means and said second cable means being less than the buoyant force of said flotation means.

4,096,599
BRUSH RETENTION MEANS FOR FLOOR TREATING MACHINES
Haydn Frank Mayo, Hazlemere, England, assignor to R. G. Dixon & Company Limited, Wembley, England
Filed Mar. 2, 1977, Ser. No. 773,842
Claims priority, application United Kingdom, Mar. 4, 1976, 8743/76
Int. Cl.[2] A47L *11/162*
U.S. Cl. 15—49 R 4 Claims

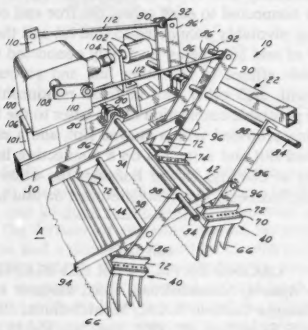


1. In a floor treating machine of the type comprising at least one rotary brush alternately engaged with and disengaged from a brush drive, the improvement which comprises a brush retaining element; an upstanding boss on the at least one brush, said boss being slidably mounted on said brush retaining element and connected to the rotary brush; an annular lip formation on said boss and including integral ribs defining two recesses in said boss; and spring clip means mounted on a rotary part of the machine for cooperating with said annular lip formation, said spring clip means being an annular spring clip receivable in one of the recesses when the rotary brush is engaged with the brush drive and receivable in the other of said recesses when the rotary brush is disengaged from the brush drive.

4,096,600
FRICTION CURTAIN APPARATUS
James A. Belanger, 370 S. Rogers, Northville, Mich. 48167
Filed Mar. 11, 1977, Ser. No. 776,791
Int. Cl.[2] B60S *3/04*
U.S. Cl. 15—97 B 13 Claims

1. A friction curtain apparatus for washing or drying or

finishing a motor vehicle comprising a frame having an opening provided with an entrance and an exit, said opening having a longitudinally extending axis between said entrance and exit, said opening being adapted to receive a vehicle for movement therethrough by relative motion between the aforesaid frame and the vehicle along a predetermined path between said entrance and exit, a pair of swingable scrubbing units pivotally carried by said frame and disposed in said opening and capable of turning in alternate directions forward and then backward with respect to said entrance and to said exit, each of said units being pivotable about a horizontal axis which is generally perpendicular to said longitudinally extending axis, one of said units being located on one side of said longitudinally extending axis and the other of said units being located on the other side of said longitudinally extending axis, each of said units comprising an elongated rack having a plurality of transversely extending elongated slot-defining apertures which are parallel to one another, said apertures having axes lying in a flat plane, a pack unit containing fill material received in each of said apertures and forming a curtain, each curtain being arranged on each rack in spaced apart, generally parallel relation relative to the other curtains, with each curtain extending generally perpendicular to said longitudinally extending axis and having an end portion which extends beyond a side of the vehicle, each curtain defining a row of closely arranged elongated flexible strips which hang freely when the units are beyond the ends of the vehicle and are substantially in continu-



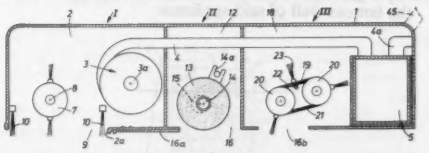
ous contact with the vehicle during the swinging movement of the rack when the units overlie the vehicle, power actuated means for swinging said racks and the curtains carried thereby through an arcuate path forward and then backward and imparting to said curtains a sweeping, scrubbing and flicking motion to permit said curtains to contact the exterior surfaces of the vehicle to finish the vehicle, said power actuated means including means for coordinating the swinging of said racks and said curtains in a predetermined phase relationship whereby the rack and curtains at one side of said longitudinally extending axis are out of phase with the rack and curtains on the other side of said longitudinally extending axis, each slot-defining aperture having a key-hole configuration, each aperture having a generally cylindrical inner portion opening downwardly through a restricted neck portion, each pack unit comprising a substantially solid, elongated, headforming and pack reinforcing support element made from a resiliently firm yet flexible plastic material, said support element including a generally cylindrical, solid, bulb-like portion having single, substantially flat, integral, solid fin portion of rectangular configuration extending from said bulb-like portion, a first sheet of generally flexible material having one portion looped tightly over said elongated support element so as to conform closely to the contours thereof and a second portion extending from the support element, said looped portion having a first section closely overlying said bulb-like portion and second and third sections integrally contiguous with the respective opposite ends of said first section tightly overlying corresponding opposite sides of said fin portion, fastening means for securing the looped portion to said first sheet to said elongated support element to prevent relative sliding movement therebetween and forming a generally cylindrical, flexible material covered bulbous head and neck portion of the pack unit which is telescopically received in the corresponding aperture for replaceably mounting said pack unit thereto, said fill material forming said curtain having an inner portion secured to the second portion of said first sheet and an outer portion engageable with the vehicle.

4,096,601

CLEANING APPARATUS FOR CARPETS, UPHOLSTERY AND THE LIKE

Leopold Knestele, 7967 Bad Waldsee, Germany

Filed Jan. 23, 1976, Ser. No. 651,688
Claims priority, application Germany, Jan. 25, 1975, 2503012
Int. Cl.[2] A47L *11/34*
U.S. Cl. 15—320 **8 Claims**



1. An apparatus for the cleaning of carpets, upholstery and the like comprising:

a housing formed with wall means defining a downwardly open suction compartment containing a rotatable brush at a leading end of said housing, means for sucking air out of said compartment, a flexible-surface vibrating body rearward of said compartment for engagement with the surface to be cleaned, said vibrating body being drivable to vibrate foam into said surface to be cleaned, a foam applicator in said housing rearward of said vibrating body, and means for feeding a foamable cleaning liquid to said applicator, said applicator comprising a belt provided with bristles and a pair of rollers spanned by the belt and rotatable to displace said bristles to apply said foamable cleaning liquid to said surface to be cleaned; and

manually controlled drive means for selectively operating either said brush alone or both said body and said applicator in conjunction.

4,096,602

DRYER DOOR STOP ASSEMBLY

James K. Nelson, Marion, Ill., assignor to Fedders Corporation, Edison, N.J.

Filed Sep. 6, 1977, Ser. No. 830,455
Int. Cl.[2] E05F *5/06*
U.S. Cl. 16—85 **5 Claims**

1. A door stop assembly in combination with an appliance having an access door pivotably secured near its lower edge to the front of the appliance; said door stop assembly comprising:

a unitary arcuate link pivotably secured at a point adjacent one end to the door;

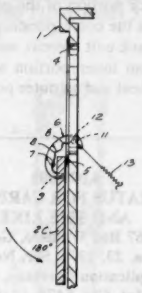
said link having an inner arcuate surface;

roller means secured to the appliance and disposed transverse to the curvature of said inner arcuate surface;

a first detent in said inner surface of said link sized and positioned to engage said roller means when said door is in a substantially 180° open position to limit and maintain said door in said 180° open position, said detent comprising a hooked portion;

and biasing means connected to said link adjacent the other end thereof to bias said inner arcuate surface of said link

into engagement with said roller means throughout the length of travel of said link, said biasing means comprising



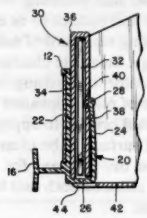
a spring connected between said other end of said link and the bottom wall of said appliance.

4,096,603

DRAWER PULL AND LABEL HOLDER

Gerald R. Klaus, St. Charles, Ill., assignor to Fellowes Manufacturing Company, Franklin Park, Ill.

Filed Nov. 1, 1976, Ser. No. 737,715
Int. Cl.[2] A47B *95/02*; B65D *5/46, 25/28*
U.S. Cl. 16—110 R **3 Claims**



1. A detachable drawer pull for a collapsible front panel of a drawer which panel includes an outermost and innermost layer hinged together along a first edge of the panel, and said outermost layer being an extension of the bottom of said drawer along a second edge of said panel opposite said edge and said drawer having an opening adjacent said second panel edge, comprising:

a generally U-shaped member including first and second leg members and a bottom member, said U-shaped member being adapted to be slid into said opening adjacent said second edge of a drawer panel front opposite said hinged edge so that the first and second leg members are adjacent to the outer and inner layers of the panel, respectively, said bottom member having a substantially flat outer surface and said first leg member having a substantially flat inner surface;

pull means positioned on the outer surface of said first leg member, extending perpendicular thereto;

label holder means positioned on the outer surface of said first leg member; and

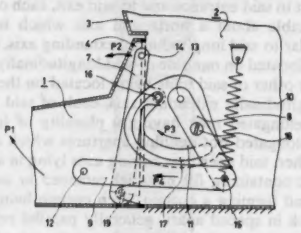
a flange adapted to engage a slot on the inner layer of the drawer front panel on said second leg member.

4,096,604

HINGE MECHANISM

Friedhelm Eckhardt, Burbach-Niederdresselndorf, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 28, 1976, Ser. No. 709,333
Claims priority, application Germany, Aug. 2, 1975, 2534652
Int. Cl.[2] A47B *95/02*
U.S. Cl. 16—128.1 **3 Claims**



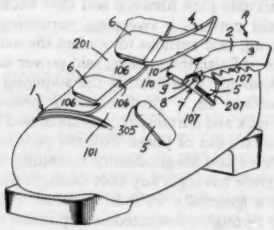
1. A hinge mechanism coupled on one side to a stationary housing and on the other side to a lid hingeable relative to the housing, which comprises a hinge spindle translatorily movable relative to the housing during opening and closing of the lid and pivotably carried by said lid, at least one pair of links pivotably connected to each other, the free end of one of said links being pivotably connected to said lid and the free end of the other of said links being pivotably connected to said housing, a guide affixed to the other link and pivotable simultaneously with said other link in fixed relationship therewith about the pivotable connection of the latter to the housing, said guide being provided with a curved slot, and a pin slidable in said curved slot and arranged on a connecting link pivotably connected at one end to the housing, the other end of said connecting link being pivotably mounted on said hinge spindle.

4,096,605

LACING DEVICE FOR SKI BOOTS

Giuseppe Annovi, Montebelluna, Italy, assignor to Calzaturificio Giuseppe Garbuio S.A.S., Montebelluna, Italy

Filed Nov. 30, 1977, Ser. No. 856,192
Claims priority, application Italy, Dec. 7, 1976, 12922 A/76
Int. Cl.[2] A43B *11/00*; A43C *11/00*
U.S. Cl. 24—70 SK **6 Claims**



1. In a ski boot of the type comprising a ski boot upper provided with two flaps defining an opening, a lacing device including a hooked lever-like lacing member provided on one flap and intended to cooperate with a ring-like lacing member on the other flap, anchoring means for securing at least one of said lacing members hingedly and in a removable manner onto the corresponding flap, said anchoring means comprising:

(a) an anchoring guide element in the form of a projection provided on the flap and presenting two side grooves arranged transversally with respect to the opening;

(b) a carrier plate onto which there is hingedly mounted the lacing member, said carrier plate presenting two exten-

sions or legs capable of slidably engaging the side grooves provided on the anchoring guide element;

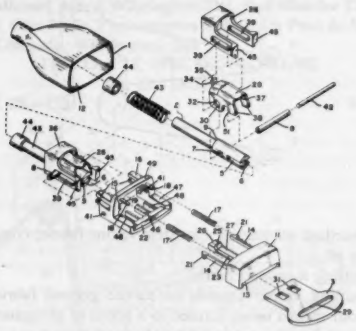
(c) a clamping element provided on said carrier plate, presenting two clamping portions which, in the operative position of the said clamping element, are arranged against the outer sides of the legs of the carrier plate, i.e. the sides which are external with respect to the grooves engaged by the said legs, so as to avoid the divarication of the said legs out of the said grooves.

4,096,606

FERRULE BUCKLE WITH SLIDING RELEASE BUTTON

Robert Larry Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Mar. 4, 1976, Ser. No. 663,942
Int. Cl.[2] A44B *11/25*
U.S. Cl. 24—230 A 11 Claims



1. A buckle for engaging a tongue comprising: a ferrule having a slot at one end for engaging a tongue; a latch member with at least one latching tooth, said latch member pivotally mounted on the ferrule for releasing motion between an engaged position and a disengaged position in reference to said tongue; a sliding release button mounted at the front of the buckle, and a tongue ejector mounted on said latch member and cooperating with the latch member and the release button for engaging and disengaging the tongue, said release motion of said latch member having a directional component which is parallel to the direction of motion of said tongue when said tongue is released from said buckle, withdrawal force on said tongue cooperating with said latch member to assist said release motion of said latch member, said buckle harnessing a portion of said withdrawal force on said tongue for use in releasing said latch member, said buckle thereby requiring a low release effort on said release button.

4,096,607

SNAP FASTENING DEVICE

Gunilla A. Carlsson, Skidbacken 38, S-172 45 Sundbyberg, Sweden

Filed Feb. 11, 1976, Ser. No. 657,315
Claims priority, application Sweden, Feb. 18, 1975, 7501797
Int. Cl.[2] A44G *13/00*
U.S. Cl. 24—230 AP 3 Claims

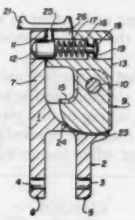
1. A snap fastening device comprising:

a fastener body (1) provided with locking means (11); and

a closure link (9), one portion (14) of which is rotatably mounted in the fastener body (1) and another portion (13) of which is provided with locking means (12) adapted to engage said locking means (11) of said fastener body, said portions (13,14) being disposed substantially perpendicularly to each other;

said fastener body (1) and said closure link (9) together defining an openable loop which is restricted by said fastener body and by said closure link;

said fastener body (1) comprising a substantially U-shaped portion having a pair of shanks (7,8), and a connecting portion connecting said shanks, one of said shanks (8) and at least a portion of said connecting portion having a guiding slot (22) therein which defines a pair of spaced apart ears, a shaft (10) attached to said one shank (8) of said pair of shanks and passing through said slot and between said ears, said closure link (9) being journalled around said shaft (10) with said one portion (14) of said closure link (9) being at least partly in the portion of said slot in said connecting portion and between said ears when in the loop open as well as when in the loop closed position to permit swivelling movement of said closure link (9) about said shaft (10) through an angle of about 90°, said ears forming guiding or bearing surfaces for said one portion (14) of said closure link (9) when said closure link (9) is in the loop open as well as the loop closed position; and the other shank (7) of said pair of shanks having a through hole (11) therein forming said locking means of said fastener body (1), said substantially U-shaped portion cooperating with said closure link (9) to restrict said openable loop, and said closure link (9) comprising a portion



which in the locked or loop closed position bridges the shanks of said U-shaped portion;

said fastener body (1) having an external connection member (2) extending from said connecting portion in a direction opposite from said shanks (7,8); and

said locking means of said closure link (9) comprising a substantially straight groove (16), a spring actuated locking pin (12) which is displaceable in said substantially straight groove (16) and which in the locking position protrudes from an edge of said closure link for cooperating with said hole (11) formed in said other shank (7) of said U-shaped portion of the fastener body (1) and a release member (21) including an actuation member provided with an actuation surface and protruding from said closure link (9), said release member (21) being coupled to said locking pin (12) for displacing said locking pin (12) into the closure link (9) against the spring action upon exertion of a direct acting compressive force on said actuation surface to a release position in which said locking pin (12) is disengaged from said hole (11) and said closure link (9) can be swivelled open by rotation thereof through an angle of about 90° relative to said fastener body (1).

4,096,608

DRILL STRING HOLDER

John Arne Lagerstedt, Skarholmen, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 9, 1976, Ser. No. 749,163
Claims priority, application Sweden, Dec. 11, 1975, 7513972
Int. Cl.[2] A44B *21/00;* E21C *11/00*
U.S. Cl. 24—249 R 24 Claims

1. Drill string holder in a rock drilling machine, comprising:

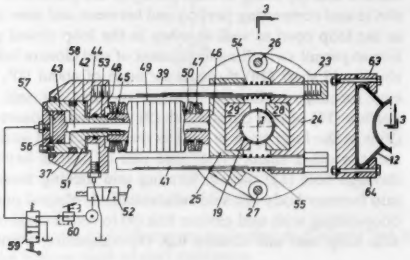
first and second jaws (24,25) mounted opposite each other for receiving a drill string or the like therebetween and for selectively gripping same,

a spring (49) operatively coupled between the jaws (24,25) to

force them towards each other into their gripping position for gripping the drill string,

a first hydraulically actuated piston device (**43**) operatively coupled to the spring (**49**) and being selectively actuable to inactivate the spring and permit the jaws to be separated,

a second hydraulically actuated piston and cylinder device (**56,57**) operatively coupled between the jaws (**24,25**) for



forcing them against each other in response to hydraulic pressure acting on the second piston and cylinder device, and

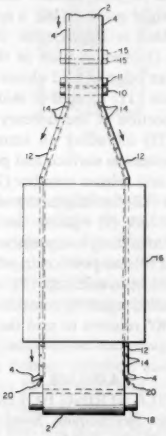
means (**59,60**) coupled to the second piston and cylinder device (**56,57**) for variably and selectively applying said hydraulic pressure acting on the second piston and cylinder device to vary the force applied thereby to the jaws to force them together when the spring is inactivated.

4,096,609

PROCESS FOR MAKING STRETCH FABRIC CAPABLE OF COURSE COUNT CONTROL UPON HEAT SETTING

James Franklin Sayre, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 28, 1976, Ser. No. 700,069
Int. Cl.[2] D04B *21/18*
U.S. Cl. 28—155 **4 Claims**



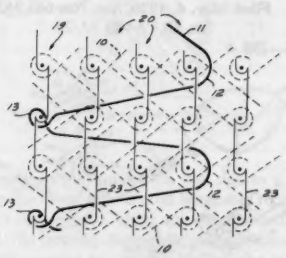
1. A process for producing a knit fabric capable of being longitudinally stretched and heat set to a predetermined course count, comprising warp knitting a longitudinally stretchable fabric of elastic and inelastic yarn and simultaneously warp knitting an additional inelastic yarn into the selvedge along each edge of said fabric, said first-mentioned inelastic yarn being overfed with respect to said additional inelastic yarn during said warp knitting, said additional inelastic yarn imparting a predetermined limit of stretchability to said selvedge which is less than the longitudinal stretchability of said fabric to limit said longitudinal stretchability during heat setting to the stretch which provides said predetermined course count, subjecting said fabric to stretching to the limit provided by said selvedge, and heat setting and fabric.

4,096,610

METHOD OF KNITTING A VELOUR FABRIC

Rudolph G. Bassist, 1003 McGrann Blvd., Lancaster, Pa. 17601

Filed Nov. 21, 1977, Ser. No. 853,683
Int. Cl.[2] D02G *1/16*
U.S. Cl. 28—159 **5 Claims**



1. A method of making a knitted velour fabric, comprising the steps of:

(a) knitting a ground fabric,

(b) knitting velour threads on to the ground fabric, each velour thread being formed as a series of elongated loops knitted into the ground fabric only at their bases,

(c) knitting stitches of soluble yarn on to the ground fabric to temporarily hold the velour thread loops flat against one face of the ground fabric, and

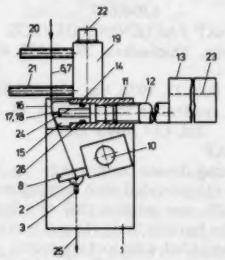
(d) thereafter treating the fabric with a liquid or vapor at a temperature and for a sufficient time to dissolve only the soluble yarn so as to free the velour thread loops to project outwardly from said face of the ground fabric.

4,096,611

APPARATUS FOR MOISTENING AND TEXTURING YARNS

Harald Heyner, Berlin, Germany, assignor to Heberlein Maschinenfabrik AG, Wattwil, Switzerland

Filed Jul. 19, 1977, Ser. No. 816,949
Claims priority, application Germany, Aug. 3, 1976, 2635341
Int. Cl.[2] D02G *1/20*; D02C *1/16*
U.S. Cl. 28—220 **9 Claims**



1. Apparatus for moistening and texturing at least one yarn consisting of filaments and travelling lengthwise through the apparatus, the apparatus comprising texturing nozzle means formed with a nozzle arranged for the yarn to pass therethrough, said nozzle means being adapted to form loops, or

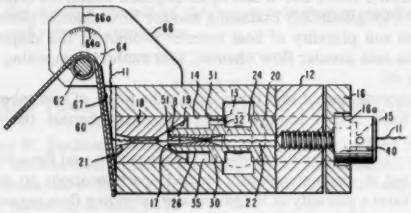
convolutions in filaments in yarn while travelling through said nozzle, delivery and guiding means for determining the path of the yarn prior to entering said nozzle and after leaving said nozzle, a member mounted in position for the yarn to pass thereover prior to entering said nozzle, said member being formed with a convexly curved surface and located for the yarn to slide thereover along a curved path while travelling towards said nozzle and said member being formed with at least one bore opening into said curved surface in said path, and means for feeding liquid through said bore, the diameter of said bore being adapted to the titer of the yarn whereby the yarn travelling over said bore exerts a suction effect on the liquid and carries the liquid between its filaments of said nozzle.

4,096,612

JET FOR FLUID TEXTURING YARN

Brian Michael Agers, Wilmington, Del., and Maurice Cornelius Todd, Glen Mills, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 13, 1976, Ser. No. 731,982
Int. Cl.[2] D02G *1/16*
U.S. Cl. 28—272 **8 Claims**



1. In a yarn texturing jet including a body having yarn inlet and outlet ends connected by a central bore, means for introducing pressurized gas through a gas inlet into said bore between said ends, a nozzle block having a conical entrance located in said bore at said outlet end, and a yarn guiding element sealing off said bore at the yarn inlet end of the body for introducing yarn into said jet, said element having a passage therethrough for guiding yarn from the yarn inlet of the body past the gas inlet through the exit end of said element to the conical entrance of the nozzle block, said element being provided with means for movement toward the conical entrance of the nozzle block for stringup and away from the nozzle block for normal fluid texturing operation, there being a space between said exit end of said element and said conical entrance for throttling the flow of pressurized fluid that flows into said space and out through the nozzle block to create air pressure less than atmospheric at the end of said element, thereby inducing an inward flow of atmospheric air through said passage to draw said yarn through said passage for stringup, the improvement for increasing said inward flow of atmospheric air through said passage to facilitate drawing yarn through said passage during stringup of the yarn comprising: a venturi positioned in said passage, said venturi having a flared inlet and a flared outlet connected by a constriction, said flared outlet being gradually expanded from said constriction to a cylindrical section within said passage and extending through the exit end of said element.

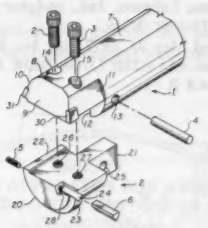
5. In a yarn texturing jet including a body having yarn inlet and outlet ends connected by a central bore, means for introducing pressurized gas through a gas inlet into said bore between said ends, a first venturi located in said bore at said outlet end, and a yarn guiding element sealing off said bore at the yarn inlet end of the body for introducing yarn into said jet, said element having a passage therethrough for guiding yarn from the yarn inlet of the body past the gas inlet through the exit end of said element to the conical entrance of the first venturi, said element being provided with means for movement toward the first venturi for stringup and away from the first venturi for normal fluid texturing operation, there being a space between said exit end of said element and said first venturi for throttling the flow of pressurized fluid that flows into said space and out through the first venturi to create air pressure less than atmospheric at the end of said element, thereby inducing an inward flow of atmospheric air through said passage to draw said yarn through said passage, the improvement for increasing said inward flow of atmospheric air through said passage to facilitate drawing yarn through said passage during stringup of the yarn comprising: a second venturi positioned in said passage, said second venturi having a flared inlet and a flared outlet connected by a constriction, said flared outlet being gradually expanded from said constriction to a cylindrical section within said passage and extending through the exit end of said element.

4,096,613

CUTTING TOOL

Victor C. Takacs, and Joseph E. Takacs, both of Houston, Tex., assignors to Triangle Grinding, Inc., Houston, Tex.

Filed Mar. 25, 1977, Ser. No. 781,207
Int. Cl.[2] B26D *1/00*
U.S. Cl. 407—92 **12 Claims**



1. A cutting tool comprising:
an elongated bar member;
an anvil member removably fastened to one end of said bar member to rigidly clamp a cutting insert between said anvil and bar member for radial projection generally perpendicular to the axis of said elongated bar member;
a support rib projecting radially from said anvil member;
an elongated recess provided in said anvil member and along said rib in which said cutting insert may be removably received for said radial projection from said bar member; and
a chip deflector of substantially harder material than said bar member affixed to said bar member for juxtaposed relationship with said cutting insert on the opposite side from said rib.

4,096,614

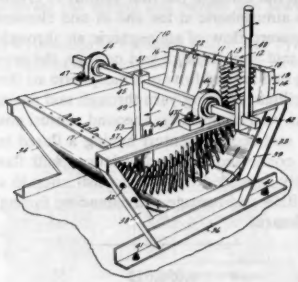
METHOD AND APPARATUS FOR REMOVING STATOR VANES

Alvin J. Brungard, Greenhills; Richard M. Galloway, and Donald P. Kerwick, both of Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Sep. 2, 1975, Ser. No. 609,601
Int. Cl.[2] B23P *15/04, 19/02, 19/04*
U.S. Cl. 29—156.8 R **15 Claims**

1. An apparatus for removing a single turbomachinery vane and associated platform from a circumferential slot containing a plurality of vanes in an arcuate casing section comprising:
(a) support means for placement on the concave side of the casing;
(b) an elongate strike element having its one end pivotably supported by said support means on the axis of the casing and having on its free end a knocker element for imparting a dynamic impact against the single vane and away from

the plurality of vanes with the resultant force being in a direction aligned with the plane of the circumferential slot



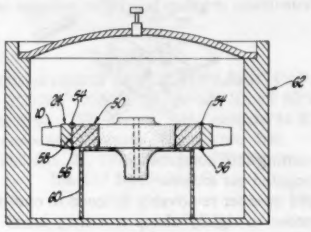
to effect removal of the vane from the slot in a circumferential direction.

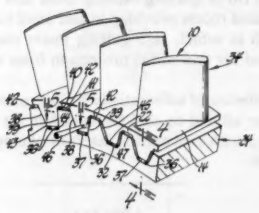
4,096,615

TURBINE ROTOR FABRICATION

Kenneth R. Cross, Lebanon, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 31, 1977, Ser. No. 802,020
Int. Cl.² B23P *15/04;* B23K *19/00*
U.S. Cl. 29—156.8 R **4 Claims**





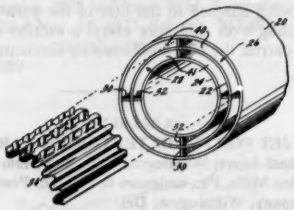
1. A method for fabricating a hybrid dual property wheel assembly comprising: preforming a plurality of blades with a base tang thereon, preforming a blade support ring including a plurality of circumferentially spaced blade position slots therein for receiving base tangs of each of said blades whereby adjacent blades are accurately dimensionally located one to the other, sealing each of said tangs within one of said position slots, thereafter machining the inside diameter of the joined blades and ring to expose portions of said blade base tangs, preforming a disc having a controlled outside diameter, press fitting the ring and blades to the disc to form a butt interface, sealing the hub disc and ring blade assemblies at joint lines on either side of the butt interface, thereafter hot isostatically pressing the joined blade, ring and hub disc components to form a diffused metallurgical bond between the blade base tangs, the ring and the disc at the interface therebetween.

4,096,616

METHOD OF MANUFACTURING A CONCENTRIC TUBE HEAT EXCHANGER

George A. Coffinberry, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Oct. 28, 1976, Ser. No. 736,571
Int. Cl.² B23P *15/26*
U.S. Cl. 29—157.3 A **13 Claims**



1. A method for use in fabricating a heat exchanger adapted to transfer heat between first and second fluids, said heat exchanger comprised of at least a pair of longitudinally extending concentric tubes, one of said tubes disposed within the other to form a longitudinally extending annular flow channel therebetween and plurality of heat transfer promoting fins disposed within said annular flow channel, said method comprising the steps of:

disposing one of said tubes within the other of said tubes to form a first longitudinally extending channel therebetween;

inserting a plurality of spacer members into said flow channel at circumferentially spaced apart locations so as to form a plurality of longitudinally extending flow segments between said plurality of spacer members;

positioning a plurality of heat transfer promoting fins within said plurality of flow segments; and

applying a radially directed deforming force to said pair of tubes in sufficient magnitude to achieve permanent deformation of said pair of tubes to retain said spacing members and said heat transfer promotion fins securely disposed within said annular flow channel.

4,096,617

AXLE PULLING MEANS

Arthur J. Ritter, Jr., Metamora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

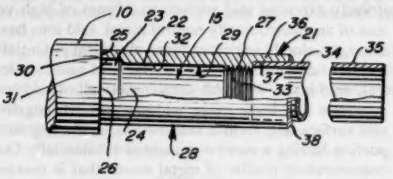
Filed May 26, 1977, Ser. No. 800,822
Int. Cl.² B25B *27/14*
U.S. Cl. 29—278 **4 Claims**

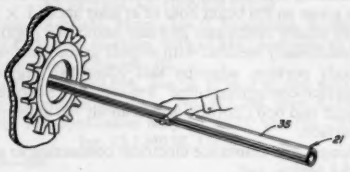
1. Structure for use in manipulating a heavy axle such as during installation in and removal from a vehicle drive assembly, said axle manipulating structure comprising:

means at one end of said drive axle defining a cylindrical support surface, an annular boss at the inner end of said support surface, a radial outwardly facing limit surface at the inner end of said boss, and a male threaded surface at the outer end of said support surface; and

a puller tool having an inner end portion defining a socket for snugly receiving said end of the axle, said socket being defined by a distal end surface abutting said axle limit surface, an inner cylindrical portion snugly fitting said boss, an inner-intermediate cylindrical portion snugly fitting said axle support surface, and an outer-intermediate female threaded portion threaded to said axle male threaded surface, said puller tool further having an elongated outer end portion defining a manipulating handle, the length of said inner-intermediate cylindrical portion being at least three times greater than the length of said outer intermediate female threaded portion, said inner cylindrical portion and inner-intermediate cylindrical

portion defining support surfaces providing positive surface engagement between the puller tool and the axle end





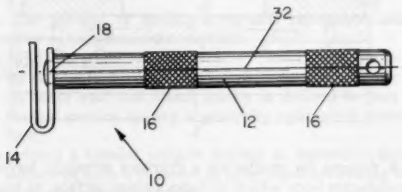
for positive control of the heavy axle during installation and removal operations.

4,096,618

HAND TOOL FOR FASTENING AND UNFASTENING SNAP FASTENERS

Irving W. Perline; Leonard Trapido, both of Kew Gardens; John J. Rottenkolber, Bronx, and Michael L. Rottenkolber, Mt. Vernon, all of N.Y., assignors to Andrew Adams Developing Corporation, Bronx, N.Y.

Filed Dec. 8, 1976, Ser. No. 748,472
Int. Cl.² B25B *27/14*
U.S. Cl. 29—278 **2 Claims**



1. A hand tool for use in fastening together mating male and female snap fasteners, comprising:

an elongated handle adapted to be held in user's hand and having a longitudinal axis;

a fork type pronged element fixedly secured to one end of said handle, the prongs of which are laterally spaced, so as to be adapted to be disposed about one of said mating fasteners so as to engage and hold the same during a fastening or unfastening operation, and are disposed in a single plane which is substantially perpendicular to the longitudinal axis of said handle;

said pronged element having a tongue element at one end thereof, at the axial center thereof, fixedly secured to said handle, such that the axial center of said tongue is aligned with said longitudinal axis of said handle, and a cut-out portion at the other end thereof which serves to define said pronged protions;

said element being folded substantially in half so as to have a substantially U-shaped configuration in side elevation such that the axial centers of said tongue and cut-out portions are axially aligned with one another,

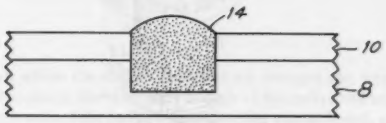
whereby the axial alignment of said handle, said tongue and said cut-out portion permits insertion or withdrawal forces to be transmitted from said handle to said prongs and said held fastener.

4,096,619

SEMICONDUCTOR SCRIBING METHOD

Charles R. Cook, Jr., North Palm Beach, Fla., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.

Filed Jan. 31, 1977, Ser. No. 764,095
Int. Cl.² B23P *17/00*
U.S. Cl. 29—413 **14 Claims**



1. A method of breaking a semiconductor material in accordance with a desired breakage pattern comprising:

anodizing preselected regions of the semiconductor material; and

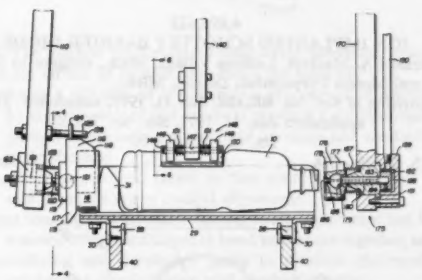
stressing said semiconductor material until said semiconductor material breaks in said regions weakened by the step of anodizing.

4,096,620

METHOD AND APPARATUS FOR ASSEMBLING A SUPPORT BASE TO THE BOTTOM OF A PLASTIC CONTAINER

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 6, 1977, Ser. No. 757,415
Int. Cl.² B23P *11/00*
U.S. Cl. 29—428 **17 Claims**



1. In a method of attaching a cup-shaped support base to a convex bottom of a container, the steps of:

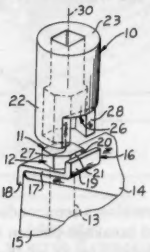
conveying a cup-shaped base along an arcuate path, simultaneously and separately conveying a container having a convex bottom aligned with said base in a separate, adjacent angularly related arcuate path, the opening in the cup-shaped base facing the convex container bottom and the central axes of the container and base being essentially parallel to the respective axes of the arcuate paths; and

as the base and container ae conveyed along their respective arcuate paths, relatively axially displacing the base and the container toward one another while accommodating pivotal movement of the base into axial alignment with the axis of the container to telescopically assemble the base onto the convex container bottom.

4,096,621
METHOD OF CONCURRENTLY ROTATING A THREADED FASTENER AND DEFLECTING A LOCKING TAB

Richard E. Berger, Pekin, and Herbert L. Wahrenburg, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 641,462, Dec. 17, 1975, abandoned.
This application Mar. 4, 1977, Ser. No. 774,369
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—526 R 10 Claims

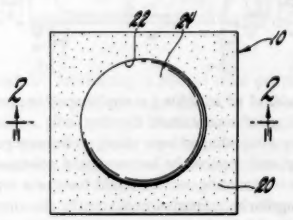


1. The method of selectively controlling the threaded disposition of a threaded element having a turning portion defining an array of flat sides relative to a member having a complementary threaded means, said flat sides of said element extending parallel to the axis of the threaded element and being disposed adjacent said member, comprising the steps of: fixedly securing a deformable retainer to said member to have a retaining portion of the retainer extend adjacent one of said element flat sides to effectively prevent threaded turning of said element relative to said member; and engaging concurrently a first, camming surface of a tool with said retaining portion and a second, turning surface of the tool with said flat sides of the threaded element other than said one flat side for concurrently separately turning said retaining portion away from said element flat side and causing threaded turning of said element relative to said member without interference by said retainer.

4,096,622
ION IMPLANTED SCHOTTKY BARRIER DIODE

Bernard A. MacIver, Lathrup Village, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 600,888, Jul. 31, 1975, abandoned. This application Jan. 14, 1977, Ser. No. 759,324
Int. Cl.[2] B01J *7/00*
U.S. Cl. 29—578 3 Claims



1. A method of making a sub-surface Schottky barrier in a semiconductive body, which barrier has electrical rectification properties substantially unaffected by contaminants on said semiconductive body, said method comprising the steps of:

covering a preselected island-like region of a surface on a semiconductive body portion with a layer that a beam of high velocity metal ions can penetrate, said layer having an ion stopping power at least about equal to that of silicon and a thickness commensurate with the thickness of an ion implanted region to be formed beneath said layer;

masking said surface surrounding said island-like region to isolate said surrounding surface from said ion beam;

uniformly exposing said surface to a beam of high velocity ions of an electronically neutral metal, said ions having an average velocity imparted by an electrical potential preselected to cause only about 50 - 60% of said ions to penetrate said layer, whereby substantially all of said ions that penetrate said layer lodge within about 500 angstroms of said surface and form a shallow island-like region in said portion having a narrow truncated substantially Gaussian concentration profile of metal atoms that is maximum at said surface;

continuing said exposure to said ion beam until said surface is given an ion beam dose of at least about 1×10^{15} atoms per square centimeter and said island-like region becomes functionally metallic with respect to the remainder of said body portion, whereby said island-like region forms a surface-contaminant-free sub-surface Schottky barrier with said body portion within about 500 angstroms of said surface;

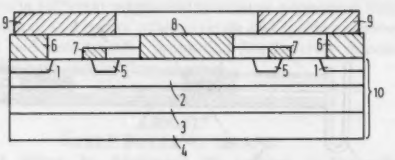
making a low resistance electrical connection to said island-like region; and

making a low resistance electrical connection to said body portion outside said region.

4,096,623
THYRISTOR AND METHOD OF PRODUCING THE SAME

Alfred Porst, and Gottfried Schuh, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Division of Ser. No. 590,706, Jun. 26, 1975, abandoned. This application Jan. 18, 1977, Ser. No. 760,272
Claims priority, application Germany, Jul. 1, 1974, 2431506
Int. Cl.[2] H01L *33/00*
U.S. Cl. 29—580 5 Claims



1. A process for producing a thyristor structure having a semiconductor body which includes a plane surface, an emitter zone at least partially covered by an emitter electrode, a base zone located adjacent said emitter zone and accessible at said plane surface of the semiconductor body, a control electrode having a plane surface in contact with said base zone, a contact electrode positioned on said emitter electrode and having a plane face above said plane surface of the semiconductor body and an auxiliary emitter zone positioned between said emitter zone and said control electrode and accessible at said plane surface of the semiconductor body, said auxiliary emitter zone having an auxiliary emitter electrode in contact therewith, the steps comprising:

providing a semiconductor body having at least a plane upper surface, an emitter zone, a base zone and an auxiliary emitter zone therein which are spaced from one another and accessible at said plane upper surface of the semiconductor body;

depositing a metal layer on said plane surface of the semiconductor body in a thickness corresponding to a desired height dimension of an emitter electrode;

masking areas of said metal layer at least partially above said zones in a pattern corresponding to a desired shape of an emitter electrode, a control electrode and an auxiliary emitter electrode with a first photo-mask;

etching uncoated metal layer areas down to said surface of the semiconductor body and thereafter removing said first photo-mask;

masking areas of the resultant metal layer at least partially above the emitter and base zones with a second photo-mask;

etching the uncoated metal layer area above the auxiliary emitter zone to a height less than the masked metal layer areas and thereafter removing said second photo-mask; and

completing said thyristor structure.

4,096,624

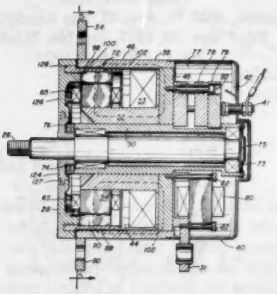
METHOD OF MAKING A VARIABLE RELUCTANCE A.C. ELECTRICAL GENERATOR

Alden J. Gray, Ashfield, Mass.; Ian S. Sanderson, Kennebunk, and John C. Hardy, Gorham, both of Me., assignors to Maremont Corporation, Chicago, Ill.

Division of Ser. No. 692,046, Jun. 2, 1976, Pat. No. 4,025,960, which is a continuation of Ser. No. 522,294, Nov. 8, 1974, abandoned. This application May 16, 1977, Ser. No. 797,344

Int. Cl.[2] H02K *15/14*

U.S. Cl. 29—596 **2 Claims**



1. The method of making a variable reluctance inductor alternator which method comprises:

providing a stator housing structure having an annular cavity substantially closed at one of its two ends and open at its other end and which cavity is defined in part by a central portion having a generally cylindrical outer surface,

providing a tubular support having an internal cylindrical surface of such a diameter as to be capable of being slip fit over said central portion,

preassembling on said tubular support (1) an annular stator core with an annular series of radially outwardly extending stator poles, (2) an annular field coil, and (3) a plurality of generating windings each received and a respective one of said stator poles,

thereafter axially sliding said preassembly of said support, said core, said field coil and said generating windings onto said central portion and into said cavity, and

subsequently fixing said preassembly to said housing structure.

4,096,625

METHOD FOR INTERCONNECTING STATOR COILS

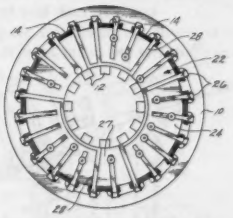
Anthony P. Morreale, Whittier, Calif., assignor to Rapidsyn Co., Santa Fe Springs, Calif.

Division of Ser. No. 629,715, Nov. 7, 1975, Pat. No. 4,039,875. This application Mar. 10, 1977, Ser. No. 776,317

Int. Cl.[2] H02K *15/00*

U.S. Cl. 29—596 **3 Claims**

1. The method of providing electrical connections to a plurality of individual wire coils wound on a salient pole motor stator, comprising the steps of: bringing the two ends of the wire forming each coil out together at the same end of the coil, forming an annular shaped printed circuit board having a plurality of radially outwardly projecting terminals electrically interconnected by the printed circuit, positioning the annular board coaxially on one end of the stator against the ends of the



coils from which the ends of the wires are brought out, wrapping and securing the wire ends of each of the individual coils to adjacent ones of the radial terminals of the circuit board, and attaching external leads to terminals on the board.

4,096,626

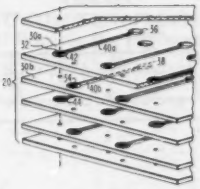
METHOD OF MAKING MULTI-LAYER PHOTOSENSITIVE GLASS CERAMIC CHARGE PLATE

Carlton Edward Olsen, San Jose, and Leroy Jasper Serpa, Campbell, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,708

Int. Cl.[2] H05K *3/10*; G01D *15/18*

U.S. Cl. 29—624 **8 Claims**



1. The method for forming a multi-layer laminated charge plate for an ink jet printer comprising the steps of:

forming a plurality of layers from a photosensitive material by etching each of said layers to produce a predetermined pattern comprising a plurality of openings and conductor paths therein;

stacking said etched layers to that corresponding ones of said openings are in coaxial alignment;

heat treating said layers by heating to a termperature and for a period of time sufficient to bond said layers together; and

metallizing said conductor paths to produce electrically conducting circuits along said conductor paths.

4,096,627

METHOD OF FORMING PORT HOLE COAXIAL CONNECTOR

Edgar Wilmot Forney, Jr., Harrisburg, and Richard Shure Hogendobler, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

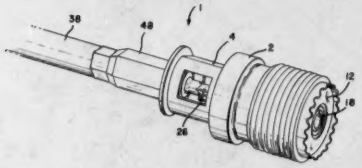
Division of Ser. No. 689,020, May 24, 1976, Pat. No. 4,047,788. This application Jun. 22, 1977, Ser. No. 808,758

Int. Cl.[2] H01G *43/00*

U.S. Cl. 29—628 **1 Claim**

1. A method of crimping a coaxial connector, comprising the steps of: inserting a coaxial connector through a rearward portion of a coaxial connector, projecting a center conductor and at least a portion of an insulation layer of said cable into a

medial portion of a connector, inserting said center conductor into a barrel portion of an electrical contact supported in a dielectric insert in a forward portion of said connector, visually inspecting said center conductor and said insulation layer and said barrel portion through at least one of a pair of opposed port holes in said medial portion, applying a shielding jacket



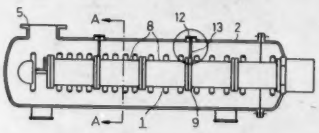
over said rearward portion, applying a ferrule over said shielding jacket, nesting opposed flat surfaces on opposite sides of said medial portion between opposed walls of a first crimping die, nesting one port hole over at least a portion of said first crimping die, and crimping said ferrule and said barrel portion with said first and a second crimping die through said opposed port holes.

4,096,628

METHOD FOR MAINTAINING THE POSITIONING OF ELECTRICAL ELEMENTS WITHIN A CONTAINER

Hans Bäckskog, Ludvika, Sweden, assignor to Asea AB, Vesteras, Sweden

Filed Dec. 20, 1976, Ser. No. 752,281
Claims priority, application Sweden, Dec. 23, 1975, 7514608
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—628 **8 Claims**



1. A method of assembling and transporting an electrical device which, when operational, includes electrical elements within a container, comprising the steps of arranging the electrical elements within a container which has openings in the walls thereof at predetermined locations, inserting transport supports radially through the openings in the walls of the container in order to contact the electrical elements therein, securing the transport supports between the container and the electrical elements, transporting the electrical device to an erection site, removing the transport supports from within the container, and covering the openings in the walls of the container.

4,096,629

MULTIPLE BLADED RETRACTABLE CLAW WEAPON

Alfred B. Levine, 2924 Terrace Dr., Chevy Chase, Md. 20015

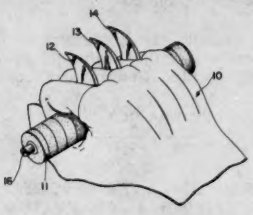
Filed May 16, 1977, Ser. No. 797,231
Int. Cl.[2] B26B *1/02, 1/08, 27/00*
U.S. Cl. 30—152 **11 Claims**

1. An artificial claw weapon comprising:

a handle means having a shape to be substantially entirely enclosed within the encircling fingers of a closed human fist,

a plurality of claw-shaped blade members spaced apart from one another along the length of the handle means and projecting transversely and substantially unidirectionally from the handle means with the spacing between adjoining blade members corresponding to the width of a human finger, whereby the blades may be interdigitated between the fingers and project outwardly from the fist when the handle means is enclosed by the fist,

and means movably attaching the blade members to the handle means for varying the orientation of the blade



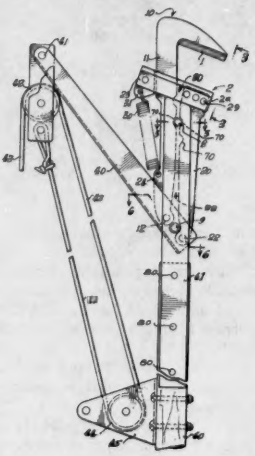
memebers with respect to the longitudinal axis of the handle means to an inactive, more compact, reposed condition, thereby to provide ease and safety in the storage and carrying of the claw weapon in the pocket and purse of the user.

4,096,630

POLE PRUNER

Cecil W. Honick, 4008 W. Ave. 43, Los Angeles, Calif. 90041

Filed Mar. 30, 1977, Ser. No. 782,640
Int. Cl.[2] B26B *13/00*
U.S. Cl. 30—258 **7 Claims**



1. A pole pruner comprising:

a pole;

a blade element having a generally-horizontal cutting edge portion facing downward and a generally vertically-depending stem portion;

an anvil element having two spaced generally-horizontal side bar portions facing said cutting edge portion and a generally vertically-depending anvil stem portion fastened thereto;

an actuating lever;

a side-plate and means fastening said side-plate to said pole;

pivot pins connecting each said stem portion to said lever at stem pivot points;

a lever pivot pin connecting said lever to said side plate at a point between said stem pivot points,

said lever thereby moving said stem portions in opposite directions,

said anvil element side bar portions and said anvil stem portions being fastened together with an anvil back filler piece to form an open box-like structure,

said blade stem portion being slidably enclosed in said structure, and said pivot pins, guide pin, and back filler piece forming the sole means to guide said blade and anvil in parallel relation; and further comprising:

a first pulley on a bracket at the outer portion of said lever,

a second pulley fastened to said pole, and

a flexible actuating cord extending from said bracket around said second pulley, then around said first pulley, and extendable downward therefrom.

4,096,631

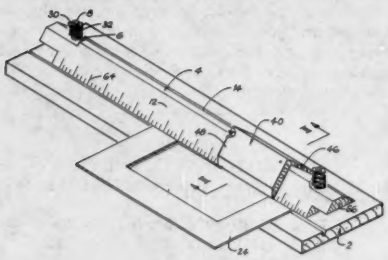
MAT CUTTING MACHINE

Richard Harry Ward, P. O. Box 241, Carpinteria, Calif. 93013

Filed Oct. 29, 1976, Ser. No. 737,055

Int. Cl.[2] B26B *29/00*; B26D *7/02*

U.S. Cl. 30—294 **12 Claims**



1. A mat cutting machine including

a base,

a guide rail attached to the base, the guide rail including a first planar surface terminating in a straight edge adjacent to the base and a second planar surface intersecting the first planar surface in a line parallel to the straight edge,

the base including a recess in line with the straight edge of the guide rail and in the plane defined by the first planar surface,

a carriage removably and slideably mounted with its first and second planar surfaces in face-to-face contact with the first and second planar surfaces of the guide rail, the carriage including a cutting blade projecting beyond the straight edge of the guide rail and into the recess of the base, a side end edge of the second planar surface of the carriage defining a plane perpendicular to the first planar surface of the carriage,

the side end edge and the planar surfaces of the guide rail and the carriage planar surfaces guiding the blade along a plane parallel to the plane of the first planar surface of the guide rail and into the recess in the base as the carriage is rocked onto the guide rail about the side end edge, whereby when a mat is placed between the guide rail and the base, the carriage as it is placed on the guide rail may be rocked down along the guide rail with the first planar surfaces transversely sliding past one another in face-to-face contact and the cutting blade thereby caused to enter the mat at the predetermined angle, this angle being the bevel angle at which the mat is to be cut.

4,096,632

DENTURE MATCHING APPARATUS

William V. Perry, 3300 Mannion Rd., Saginaw, Mich. 48603

Filed May 24, 1976, Ser. No. 689,637

Int. Cl.[2] A61C *11/00*

U.S. Cl. 32—32 **20 Claims**

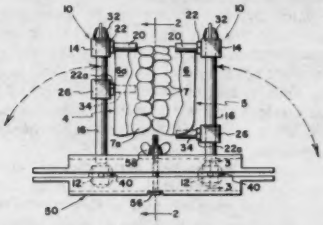
20. Denture mounting apparatus comprising:

a longitudinally extending frame including movable clamping frame portions;

first and second, longitudinally spaced, denture support members for releasably supporting first and second dentures;

means mounting each denture support members on said clamping frame portions for bodily movement toward and away from the other support member and for swinging movement relative to said frame portions to precisely align and orient said dentures; and

means for clamping said clamping frame portions to said denture support members in any selected one of a plurality of positions;



said frame portions comprising generally horizontal, laterally spaced, vertically opposed clamping bars selectively movable toward and away from each other to clamp said denture support members in adjusted positions; said mounting means mounting said denture support members on said clamping bars for swinging movement between generally vertical positions perpendicular to said bars and generally horizontal positions parallel to said bars.

4,096,633

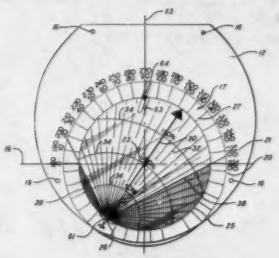
ANTI-COLLISION PLOTTER

W. Paul Nolan, 427 Winthrop Dr., Pittsburgh, Pa. 15237

Filed Mar. 9, 1977, Ser. No. 775,968

Int. Cl.[2] G01C *21/20*

U.S. Cl. 33—1 SD **13 Claims**



1. An airborne plotter for automatically providing a visual display containing potential collision information regarding closing aircraft flying at about the same altitude as the inflight first aircraft including

a back plate and a cover plate supported in spaced apart relationship by spacer means;

a transparent window provided in the face of the cover plate of the plotter having a semicircular compass rose imprinted thereon;

a range circle also imprinted upon the window inside the compass rose and being concentric therewith;

an opaque mask positioned behind the window and being pivotably secured between the plates in the plotter about a pivot means positioned upon the range circle at the point where a diameter of the circle perpendicular to the base of the semicircular compass rose intersects the circle opposite the compass rose, the mask having two perpendicular sides that intersect at the pivot point;

a course index line inscribed upon the viewing face of the mask which bisects the right angle between the sides thereof for setting the aircraft course into the compass rose whereby the sides cut arcuate shaped sectors in the range circle that are indicative of zones of primary importance; and

means to move said mask to a desired heading.

7. An airborne plotter for providing potential collision information in regard to other aircraft flying about the same altitude of a first aircraft including

a back-plate and a cover plate supported in spaced apart relationship by spacer means;

a transparent window formed in the cover plate having a semicircular compass rose imprinted thereon;

a transparent course indicator dial rotatably supported in the cover plate of the plotter upon a first pivot means located at the radial center of the compass rose, the dial having a range circle which is concentric with said radial center and a diameter which is smaller than the diameter of the compass rose;

an opaque mask having two perpendicular sides, the mask being pivotably supported in the course indicator dial upon a second pivot means at a point on the range circle, said two sides intersecting at said pivot point;

a stationary post supported in the back-plate of the plotter and being arranged to extend into a slotted opening formed in the mask that is axially aligned along the bisector of the right angle formed by said sides of said mask, the post being positioned on the range circle at the point where the radius of the compass rose normal to its base intersects the range circle; and

means to set the indicator dial into the compass rose to the aircraft heading whereby the sides of the mask are automatically moved to cut arcuate sectors in the range circle which are of primary interest to the pilot of said aircraft.

4,096,634

METHOD AND DEVICE FOR THE MEASUREMENT OF ANGLES ON SPACE PLANES

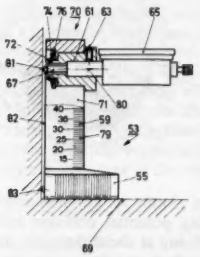
Alfred Gudel, Gaswerkstrasse 26, 4900 Langenthal, Switzerland

Filed Jul. 19, 1976, Ser. No. 706,740

Claims priority, application Switzerland, Jul. 22, 1975, 9595/75; Jan. 31, 1976, 352/76

Int. Cl.[2] G01B *3/56*

U.S. Cl. 33—75 C **8 Claims**



1. A device for angle measurement of space planes, including: an angle element with two legs rigidly connected to each other and having a specific angle ratio to one another, said legs having longitudinal axes which intersect at a right angle; a planar contact device formed by a plane surface of one of said two legs which is a reference leg for contact with at least two contact points of a space plane located at said reference leg, said planar contact device extending in parallel to said reference leg's longitudinal axes; first and second contact elements mounted on the other of said two legs which is a measuring leg for contact with at least two additional points of said space plane, whereby said contact elements determine at least two distance lines between said measuring leg and respective contact points, said distance lines extending in parallel to the longitudinal axes of said reference leg; means for adjustably supporting at least the first of said contact elements on said measuring leg so that the distance of the respective contact point is variable with respect to the measuring leg, said measuring leg having a longitudinal slot; said first contact element being mounted via slide means in said measuring leg so that it can be measurably moved along said measuring leg, said slide means being spring mounted in said slot to fix it movably in said slot, said first contact element being mounted on the measuring leg at a greater distance from said reference leg than said second contact element, said second contact element on said measuring leg comprising a pair of contact elements for contacting said space plane at least at two spaced apart contact points, said two contact points defining a line which extends normally with respect to the plane defined by said two legs, at least said said first contact element comprising means for automatic adjustment of the length thereof under contact pressure, a measuring device connected to said first contact element in order to measure the distance between the respective contact point of said first contact element and said measuring leg, a measuring scale on said measuring leg between said two contact elements in order to determine the distance between said two contact elements.

4,096,635

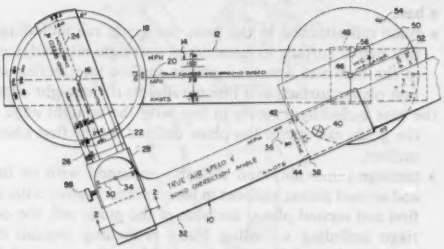
NAVIGATIONAL COMPUTER

Lon M. McMillan, Regency Apartments 209-5, Warner Robins, Ga. 31093

Filed Jul. 19, 1976, Ser. No. 706,183

Int. Cl.[2] B43L *13/00, 7/06;* **G06G** *1/02*

U.S. Cl. 33—98 **9 Claims**



1. A navigational computer comprising a first arm carrying indicia denoting a first scale, a second arm, said second arm carrying indicia denoting a second scale, a third arm, said third arm carrying indicia denoting a third scale, a first compass rose, means to pivotably secure one end of said first arm and one end of said second arm and said compass rose to each other, said compass rose being disposed intermediate adjacent faces of said first arm and said second arm, said first compass rose carrying indicia in a first circularly disposed scale, means to slideably and pivotably secure one end of said third arm along a selected portion of a length of said second arm, means to slideably and pivotably engage a selected portion of the length adjacent the other end of said third arm to a selected portion of the length adjacent the other end of said first arm, a second compass rose, said second compass rose being disposed at said selected portion of said length of said first arm, said second compass rose carrying indicia in a second circularly disposed scale, first indicating means for use as a sight in conjunction with said second scale extending across the entire width of said second arm, said first indicating means disposed at said one end of said third arm, second indicating means for use as a sight in conjunction with said third scale extending across the entire width of said third arm, said second indicating means disposed at said selected portion of said length adjacent said other end of said third arm, third indicating means for use as a sight in conjunction with said first scale extending across

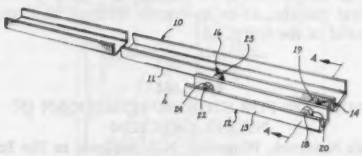
the entire width of said first arm, said third indicating means disposed at said selected portion of said length adjacent said other end of said first arm, fourth indicating means for use as a sight in conjunction with said first circular scale, said fourth indicating means disposed along the length of said first arm extending radially outwardly from the center of said first compass rose and adjacent said first scale, fifth indicating means for use as a sight in conjunction with said first circular scale, said fifth indicating means disposed parallel to the longitudinal axis of said second arm and extending radially outwardly from the center of said second compass rose, sixth indicating means for use as a sight in conjunction with said second circular scale, said sixth indicating means disposed substantially parallel to the longitudinal axis of said third arm extending radially outwardly from the center of said second compass rose and adjacent said second scale.

4,096,636

MOTORCYCLE WHEEL ALIGNMENT TOOL

Michael D. Little, 5718 N. 18th Pl., Phoenix, Ariz. 85016

Filed Oct. 26, 1976, Ser. No. 735,151
Int. Cl.[2] G01B *3/30, 5/255*
U.S. Cl. 33—169 R **5 Claims**



1. An alignment tool for aligning the front and rear wheel mounted tires of a motorcycle having an alignment adjustment mechanism on one of the wheels, said tool comprising:

a. a first bar of a length sufficient to extend fore and aft along chords on one side of the sidewalls of the front and rear tires;

b. a first alignment edge disposed upon said bar for making contact on two points on the sidewall of the front wheel tire to define a plane orthogonal to the axis of the front wheel; and

c. a spacer bar having at least an L-shaped cross section having second and third alignment edges disposed each being capable of bar for making contact on two points on the sidewall of the rear wheel tire to define a further plane orthogonal to the axis of the rear wheel;

d. means mounting said spaces bar on said first bar for discrete lateral adjustment parallel thereto, said mounting means being selectively connectable to either leg of said L-shaped cross section to permit selected use of said second and third alignment edges;

whereby, the front and rear wheel alignment is effected by setting the spacer bar at a predetermined position with respect to said first bar corresponding to the desired wheel alignment, and operating the alignment adjustment mechanism until each of the first and selected alignment edges makes contact with the two points on the respective sidewall to bring said plane into parallelism with said further plane.

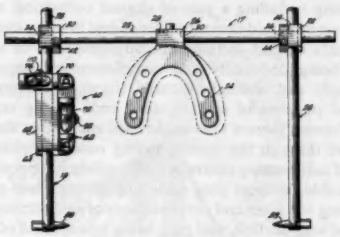
4,096,637

ORIENTING DEVICE FOR DENTAL FACEBOW OR PANTOGRAPH

Elwood H. Stade, R.R. #3 Box 369C, Edwardsville, Ill. 62025

Filed Apr. 22, 1976, Ser. No. 679,465
Int. Cl.[2] A61C *19/04;* G01C *9/28*
U.S. Cl. 33—174 D **3 Claims**

1. In combination, a facebow and facebow orienting means, said facebow comprising a first and a second spaced temple portion and a transverse portion, said facebow being adapted to encircle the frontal face zone of a patient, said orienting device comprising a body, a first leveling gauge means including first pivotal means pivotally connecting said first leveling gauge means to the body for swinging movement in a first vertical plane, a second leveling gauge means including second pivotal means pivotally connecting the second leveling gauge means to the body for pivotal movement of said second leveling gauge means in a vertical plane perpendicular to the plane of pivotal movement of said first leveling gauge means, and



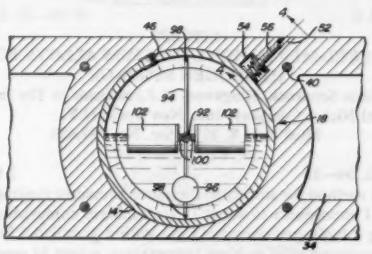
adjustment means to pivotally move the gauges with respect to the body and to hold the gauges to the body in adjusted positions, and means to mount the body to said facebow with said first leveling gauge means being oriented generally parallel to a line connecting the ends of said temple portions, and said second leveling gauge means lying in a generally horizontal plane when said facebow is in its use position.

4,096,638

PENDULUM

Fred H. Schimming, Pea Ridge, Ark., assignor to Roland Clardy and Ray Green, Rogers, Ark., part interest to each

Filed Dec. 20, 1976, Ser. No. 755,623
Int. Cl.[2] G01C *9/12*
U.S. Cl. 33—396 **2 Claims**



1. A level comprising a body defining first and second pairs of opposite sides and a cylindrical opening in said body extending between and opening outwardly of said first pair of sides, said second pair of sides being adapted for selective abutting against a surface whose orientation relative to the horizontal is to be measured, a level assembly disposed in said opening, said level assembly including a sealed hollow housing having opposite sides facing outwardly of said first pair of sides, journal means carried by central portions of said housing sides, indicator means including a horizontal shaft extending between and journaled from said journal means and pointer arm means carried by and projecting outwardly from at least one side of said shaft and including outer end provided with indicator means closely adjacent and swingable about the inner surfaces of the outer peripheries of said housing sides, said housing sides including indicia spaced about said outer peripheries with which said indicator means is registrable, second arm means carried by said shaft and projecting outwardly from opposite sides thereof, the outer ends of said second arm means including float elements spaced along said second arm means in a line normal to a diametric plane of said shaft containing said indica-

tor means, a quantity of liquid contained within said housing to a level with said float elements disposed in said liquid and buoyed up thereby with a force substantially to the weight of said indicator means, whereby the shaft ends and journal means function primarily to guide the indicator means during its oscillation rather than support of the indicator means between said housing sides, said float elements coacting with liquid to support said pointer arm means in vertical position, said housing including a pair of aligned cylindrical opposite end sections with said opposite sides of said housing closing the remote ends of said sections, the adjacent ends of said end sections being oppositely and complementary stepped and interfittingly and sealingly secured together, corresponding peripheral portions of said adjacent ends having registered notches formed therein opening toward each other and defining a port through the corresponding outer peripheral wall portion of said housing centrally intermediate its opposite ends, a puncturable resillient plug extending through said port and overlapping the inner and outer surfaces of said corresponding peripheral wall portion, said plug being constructed of a material rendering said plug repeatedly puncturable by a hollow needle and self resealable each time the needle is withdrawn, said housing being removably and rotatably received in said body opening, said body having a bore formed therein extending generally radially of said cylindrical body opening and opening outwardly of one of said second pair of sides of said body at its outer end and into said body opening at its inner end, the inner end of said bore including a diametrically enlarged counterbore, the outer end of said bore being threaded, an abutment screw threaded in said outer end of said bore and including an inner end head loosely received in said counterbore, an abutment piston disposed in said counterbore, and a compression spring interposed between said head and abutment piston, said abutment piston being projectable, at least slightly, from said counterbore into said body opening for frictional abutting engagement with the opposing outer surface portion of said housing.

4,096,639

NICKEL-MISCHMETAL-CALCIUM ALLOYS FOR HYDROGEN STORAGE

Gary Dale Sandrock, Ringwood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,483
Int. Cl.[2] F26B *5/04*
U.S. Cl. 34—15 **2 Claims**

1. A method for storing hydrogen at pressures ranging from about 1 atmosphere to about 15 atmospheres comprising, contacting a hydrogen containing gas with a granulated $Ni_5M_{1-y}Ca_y$ compound at an ambient temperature, where M represents mischmetal and y is from about 0.2 to about 0.9.

4,096,640

METHOD AND APPARATUS FOR THERMAL TREATMENT OF OR FOR MATTER-EXCHANGE WITH POURABLE MATERIAL

Wolfgang Krambrock, Ravensburg; Hansjörg Schwedes, Cologne; Wolfgang Richter, Refrath, and Klaus Elgeti, Schildgen, all of Germany, assignors to Waeschle Maschinenfabrik GmbH, Germany

Filed Sep. 3, 1976, Ser. No. 720,451
Claims priority, application Germany, Sep. 2, 1975, 2539042
Int. Cl.[2] F26B *3/08;* **F27B** *15/00*
U.S. Cl. 34—10 **13 Claims**

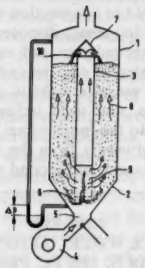
1. A method of treating pourable material, comprising the steps of

accommodating a body of the pourable material in a vessel having a lower end and a central, upright unobstructed passage provided with a bottom end portion which is surrounded by the material;

directing a stream of gaseous fluid into the lower end of the vessel;

splitting the stream into a high-speed first flow and a second flow;

entraining the material surrounding the bottom end portion with the high-speed first flow and conveying it upwardly in the central passage, so that due to the repetition of such



entraining the body of material becomes gradually turned over in the vessel; and

directing the second flow through the body outside the central passage, so as to trickle through and treat the material of the body.

4,096,641

METHOD FOR STORING HYDROGEN IN NICKEL-CALCIUM

Gary Dale Sandrock, Ringwood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,481
Int. Cl.[2] F26B *5/16*
U.S. Cl. 34—15 **2 Claims**

1. An improved method for hydrogen storage, the improvement comprising: storing hydrogen in a $CaNi_5$ compound at a hydrogen partial pressure below about one atmosphere absolute and at temperatures below about 40° C.

4,096,642

APPARATUS FOR HEAT EXCHANGE BETWEEN FINE MATERIAL AND GAS

Wolfgang Triebel, Oelde, Germany, assignor to Polysius, AG, Neubeckum, Germany

Filed Dec. 10, 1976, Ser. No. 749,473
Claims priority, application Germany, Jan. 19, 1976, 2601776
Int. Cl.[2] F26B *17/00*
U.S. Cl. 34—57 R **8 Claims**

1. Counterflow heat exchanger apparatus for heat exchange between fine material and gas, comprising a generally vertical reaction vessel which is divided by funnel-like constrictions into a number of individual chambers and which has at least one inlet for introducing fine material into the top of the upper-

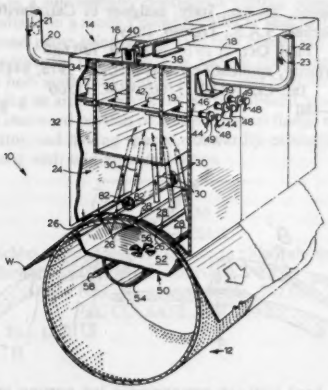
most of such chambers and an opening at the bottom of the lowermost of such chambers for withdrawing heated fine material and for introducing hot gas to be exhausted from said uppermost chamber, each individual chamber having a substantially cylindrical portion above a funnel portion, and a central scattering cone at the upper end of each of said funnel portions, wherein the improvement includes guide elements for the fine material extending downward along the inner surface of at least one funnel portion of the chambers, the guide elements being distributed around said inner surface of said at least one funnel portion.

4,096,643

PAPER WEB STREAK DRYING SYSTEM

Ralph James Futcher, Beaconsfield, Canada, assignor to Dominion Engineering Works Limited, Lachine, Canada

Filed Jan. 17, 1977, Ser. No. 759,679
Claims priority, application Canada, Jan. 21, 1976, 244031
Int. Cl.² F26B *11/02*
U.S. Cl. 34—122 **6 Claims**



1. Web drying apparatus for use in providing selectively differentiated drying across the face of a web comprising a dryer drum rotatably mounted to receive thereon a web in drying relation; a plurality of hood segments in axial abutting relation to provide adjoining control zones across the width of the web, each hood segment having a plurality of outlet nozzles for the supply of pressurized air inwardly towards the face of the drum, and a plurality of return flow conduits to receive in operation a return flow of air from the web surface; a return plenum having the return flow conduits connected thereto; a hot air conduit; a cold air conduit; a mixing chamber communicating with the outlet nozzles; hot air supply means and cold air supply means respectively connected to the hot air conduit and the cold air conduit; and hot air flow control means and cold air flow control means to regulate air flow and temperature within the mixing chamber, whereby the drying capability of each respective hood segment can be selectively controlled.

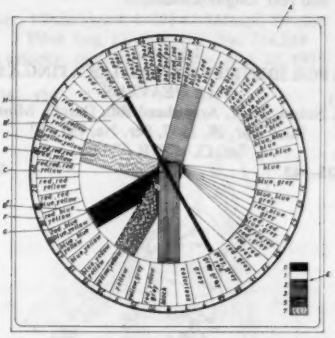
4,096,644

EDUCATIONAL AID

Dan Nesher, 7 Soroka St., Haifa, and Yigael Zemer, 5, Koreh Hadorot, Jerusalem, both of Israel

Filed Jun. 9, 1976, Ser. No. 694,405
Claims priority, application Israel, Feb. 18, 1976, 49058
Int. Cl.² G09B *19/02*
U.S. Cl. 35—31 R **6 Claims**

1. An educational aid comprising a plurality of transparent means each representing a certain basic color and a board on which a plurality of primary numbers are each represented by a different one of said certain basic colors the transparent means being movably attached in spaced relationship to said board in a manner such that they may be selectively brought into over-lying relationship, one with another thereby to obtain a composite number by fields of color the corresponding basic colors being in unit quantities according to the factors making up said composite number, so that given a certain field of color corresponding to a composite number, the student can



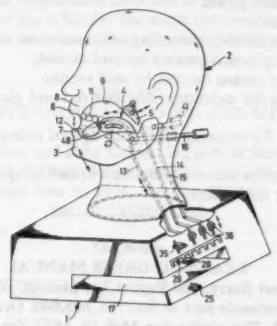
match said field by the correct mixture of said means having basic colors and thereby find the factors of the number represented by said field, or conversely the student can mix said means having said certain basic colors in unit quantities and match the resulting color with a field of color and thereby learn multiplication.

4,096,645

PHONETIC TEACHING DEVICE

Thomas Herbert Mandl, Oststrasse 20, 4005 Meerbusch I, Germany

Filed Nov. 8, 1976, Ser. No. 739,785
Int. Cl.² G09B *19/04, 23/32*
U.S. Cl. 35—35 R **8 Claims**



1. In a teaching device, indicating means for indicating the forms of a plurality of articulation organs used during the oral production of sound and the positions of said plurality of articulation organs during the natural oral production of a particular sound, and control means for selective operation of said indicating means to indicate the positions of said organs during the natural oral production of a plurality of particular sounds, said indicating means comprising a plurality of indicating members having physical forms corresponding to said plurality of articulation organs, and said control means comprising means for selectively positioning said plurality of indicating members, head structure means associated with said indicating members for indicating the form of internal passage walls which cooperate with said articulation organs in the production of sounds and the relationship of said internal passage

walls to said articulation organs represented by said indicating members, said indicating members including rear and front tongue members for representing rear and front parts of a tongue, first pivot means for supporting said rear tongue member for pivotal movement and also for longitudional forward and rearward movements relative to said head structure means, and second pivot means for supporting said front tongue member from said rear tongue member.

4,096,646

DEVICE FOR IDENTIFYING AND LOCATING A STAR IN THE HEAVENS

Philip M. Solem, 30 W. Arrowhead Rd., Duluth, Minn. 55803

Filed Apr. 28, 1977, Ser. No. 791,687
Int. Cl.[2] G09B *27/06*
U.S. Cl. 35—43 **12 Claims**

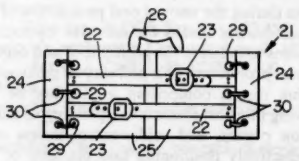
1. A device for identifying and locating a star in the heavens comprising:
(a) an axis rod,
(b) a globe,
(c) means rotatably mounting said globe on said axis rod,
(d) means on said globe indicating the location counterpart of the stars in the heavens,
(e) a hoop,
(f) means mounting said hoop on said axis rod for rotation about said globe,
(g) a mount,
(h) means slidably mounting said mount on said hoop,
(i) viewing means carried by said mount,
(j) pointer means carried by said mount,
(k) means for mounting said axis rod and globe at selected angles,
(l) means for securing said globe against rotation on said axis rod,
(m) means for securing said mount, said hoop and said globe against movement.

4,096,647

LEARN-TO-DRESS MANUAL

James Robert Barry, 160 Regent St., Lincoln, Ill. 62656

Continuation-in-part of Ser. No. 625,000, Oct. 22, 1975, abandoned. This application May 11, 1977, Ser. No. 795,752
Int. Cl.[2] G09B *19/00*
U.S. Cl. 35—56 **5 Claims**



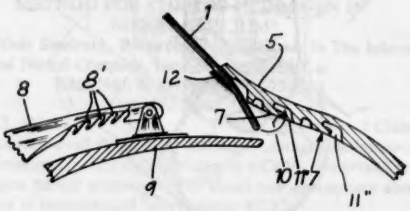
1. A learn-to-dress manual comprising: a relatively rigid flat base lamina; a shoe top, including lacings, fixed to the upper surface of said base lamina; a plurality of superposed pairs of stain-and tear-resistant panels simulating garment members to be interconnected in dressing operations, each pair being centrally divided and each divided portion being swingable laterally away from the other portion thereof to expose the next pair therebeneath, each pair having co-operating conventional means for interconnecting said divided portions in dressing-simulating manner, the upper surfaces of said pairs of garment-simulating panels being of bright attractive colors differing markedly from the colors of the immediately preceding and following pairs, and the under surfaces of said panels being of non-distracting coloration; a plurality of arched-portion rods fixed to the lateral margins of said base lamina; eyelets in the lateral margins of said panels loosely embracing said rods; a pair of relatively stiff cover panels apertured to receive said arched-portion rods; and at least one pair of belt sections including a belt buckle, to fasten said cover panels protectively over said pairs of garment-simulating panels and to constitute an introductory exercise.

4,096,648

SKI BOOT FASTENER

Giuseppe Guolo, Treviso, Italy, assignor to Calzaturificio Giuseppe Garbuio S.A.S., Treviso, Italy

Filed Oct. 7, 1976, Ser. No. 730,686
Claims priority, application Italy, Oct. 10, 1975, 84149 A/75
Int. Cl.[2] A43B *11/00*; A43C *11/00*
U.S. Cl. 36—50 **8 Claims**



1. A ski boot fastener comprising a leg portion including separated parts adapted to be fastened around a skier's leg, a mechanical fastener on one of said parts of the leg portion, a coacting fastening loop on the other part of said leg portion and extending beyond the free end of said other part for connection with said mechanical fastener, and said other part being formed on its interior surface to provide spaced securing elements for selective engagement with the fastening loop to thereby render the fastening loop adjustable longitudinally on said other part to plural fixed positions, said other part being also recessed in its interior surface in surrounding relation to said securing elements, whereby one end of said fastening loop can be selectively engaged around one of the securing elements while the fastening loop is within the recess of the interior surface of said other part, and said spaced securing elements being flush with the interior surface of said other part and said loop during usage lying below said interior surface.

4,096,649

ATHLETIC SHOE SOLE

Albert C. Saurwein, 19702 - 37th Pl. S., Seattle, Wash. 98188

Filed Dec. 3, 1976, Ser. No. 747,353
Int. Cl.[2] A43B *13/04*
U.S. Cl. 36—32 R **34 Claims**

1. A shoe sole having a heel section and a toe section comprising:
a peripheral flange running substantially continuously around the periphery of said heel section and said toe section, said peripheral flange being integral with said heel section and said toe section and extending downwardly and outwardly therefrom, said peripheral flange terminat-

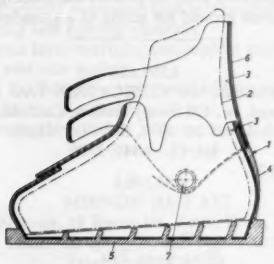
ing in a substantially continuous bottom edge lying in a first plane, and

a downwardly extending toe section flange positioned in the toe section of said shoe sole, said toe section flange having an arcuate forward portion spaced inwardly from the forward portion of the peripheral flange on the toe section, having laterally spaced, rearwardly extending side portions spaced inwardly from said peripheral flange and joined to the arcuate portion of said toe section flange, and having an arcuate rearward portion joined to the side

portions of said toe section flange to form an annularly shaped toe section flange, said toe section flange terminating in a substantially continuous bottom edge lying substantially in a second plane parallel to said first plane, said second plane lying below said first plane, and

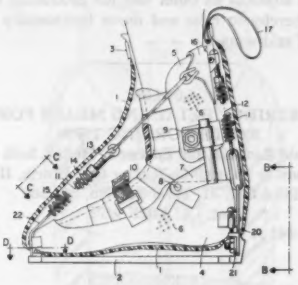
a downwardly extending heel section flange positioned in the heel section of said shoe sole, said heel section flange having an arcuate rearward portion spaced inwardly from the rearward portion of said peripheral flange on said heel section and having spaced, forwardly extending portions joined with said arcuate portion.

4,096,650
FOOTWEAR
Sigurd Seidel, Graz, Austria, assignor to Skischuhfabrik Dynafit Gesellschaft m.b.H., Graz, Austria
Filed Nov. 15, 1976, Ser. No. 742,060
Int. Cl.[2] A43B *5/04, 1/10*
U.S. Cl. 36—120 **1 Claim**



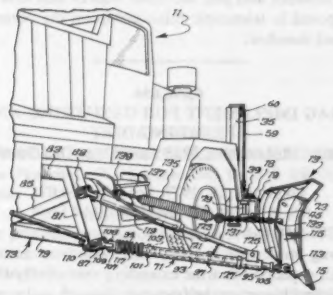
1. A ski boot comprising: an outer shoe having an integral shell formed of at least partially transparent plastics material and having an upper portion and a sole portion; a gaiter formed of at least partially transparent plastics material and hingedly connected to and partially overlapping a portion of the outer surface of said upper portion of said outer shoe; a first lining comprised of a textile fabric which resists tearing and temperatures up to about 150° C and substantially resists penetration of the plastics material when the same is in a molten state, said first lining being firmly bonded to the inner surface of said outer shoe during the molding of the outer shoe; a second lining comprised of a textile fabric which resists tearing and temperatures up to about 150° C and substantially resists penetration of the plastics material when the same is in a molten state, said second lining being firmly bonded to the inner surface of said gaiter during the molding of said gaiter; and an inner shoe inserted into said outer shoe, the inner shoe being at least partially held in said outer shoe by the coefficient of friction between said inner shoe and said lining, the coefficient of friction being greater between said inner shoe and said first lining than between said inner shoe and said outer shoe thereby insuring a good fit of said inner shoe in said outer shoe.

4,096,651
SKI BOOT
Per Ancker, Vändstigen 4, S-181-42 Lidingö, Sweden
Filed Aug. 13, 1976, Ser. No. 714,119
Claims priority, application Sweden, Aug. 22, 1975, 7509358
Int. Cl.[2] A43B *5/04*
U.S. Cl. 36—120 **10 Claims**



1. A ski boot for downhill skiing, comprising an inner shell including an upper tibia-supporting section and a unitary lower foot-supporting section, means for pivotably connecting said upper section to said lower section for movement relative thereto about a horizontal pivotal axis, a sole adapted for mounting on a ski and an outer environment and climate shield enclosing said inner shell formed of a relatively soft material foldable downwardly to expose said inner shell, said lower section of the inner shell being attached to the sole in such a way that it is pivotable in relation to the sole about an axis generally in the longitudinal direction of the ski and parallel to the plane of the ski, whereby the angle between the foot/tibia and a normal to the plane of the ski can be adjusted sideways.

4,096,652
RETRACTABLE SNOWPLOW WING AND MOUNTING THEREFOR
William L. Raines, and John Karges, Jr., both of Sherman, N.Y., assignors to H. K. Nuttall Equipment Co., Inc., Sherman, N.Y.
Filed Nov. 8, 1976, Ser. No. 739,940
Int. Cl.[2] E01H *5/00*
U.S. Cl. 37—41 **16 Claims**



1. In a retractable snowplow wing: means for mounting said wing on a vehicle having a longitudinal frame comprising opposed longitudinal members, said mounting means compris-

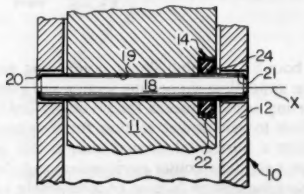
ing first means attached to the inboard end of said wing for supporting and raising said inboard end and second means, separate and distinct from said first means, attached to the outboard, trailing end of said wing for supporting and raising said outboard end, said first means comprising a member slidably mounted for vertical movement on support means carried by said frame, said second means comprising a strut and motor means both pivotally mounted on a rigid, non-movable bracket that is secured to both longitudinal members of said frame and extends laterally therefrom, said strut constituting the sole support for the outboard end of said wing and being pivotally connected to said wing adjacent the bottom of said wing, and said motor means being operatively connected to and slidable on said strut adjacent its outer end for producing motion of said strut whereby to raise and move horizontally said outboard end of said wing.

4,096,653

CARTRIDGE RETAINING MEANS FOR EARTHWORKING TIPS

Willard Oswald Kaarlela, and Eugene L. Helton, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 31, 1974, Ser. No. 519,568
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—142 A **12 Claims**



1. In an earthworking device comprising a support member, a work tool mounted on a forward end of said support member, a cylindrical pin having a generally smooth surface disposed in aligned bores formed through said support member and said work tool and retaining means to releasably hold said pin in said bore, the improvement wherein said retaining means comprises an annular cartridge including a housing defining an annular chamber therein and an annular elastomeric member disposed in said chamber to have an inner portion thereof extend radially inwardly therefrom into circumferential frictional engagement with said pin, said annular cartridge being mounted in a counterbore in a lateral side of said support member coaxially with said aligned bores, said housing comprising a pair of cupshaped first and second members each having an annular outer wall and a sidewall extending radially inwardly towards said pin, the outer wall of said first member being disposed in telescopic relationship on the outer wall of said second member.

4,096,654

DRAG IMPLEMENT FOR GATHERING AND SPREADING DIRT

Henry Felton McLaughlin, 3925 Sand Ridge Dr., Gautier, Miss. 39553

Filed Sep. 19, 1977, Ser. No. 834,071
Int. Cl.[2] E02F *3/00*
U.S. Cl. 37—118 R **4 Claims**

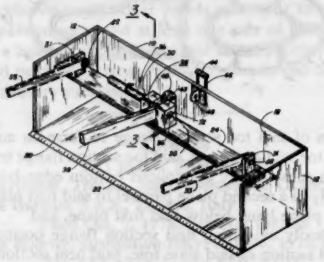
1. A drag implement for use with a garden tractor having horizontally spaced lift arms extending rearwardly therefrom for raising and lowering the free ends thereof, and comprising:

a. a rectangular bucket means having closed back, bottom and sides, and open front, and an open top, said bottom having a leading sharp edge for gathering dirt, and said bucket for pivotally suspending on the raised free ends of said rearwardly extending lift arms with open top up and said leading sharp edge parallel with the ground;

b. a first transverse element means fixed across said open top, adjacent said open front, for transversely bracing said closed sides;

c. jam bar assembly means center mounted on said first transverse element means, and having a second transverse element means slidably supported above said first transverse element means, for defining an openable and closable center space between said transverse element means;

d. jam bar means, having a vertical dimension less than the height of said center space, pivotally mounted on the back



of said garden tractor and adapted for a free end thereof to extend through said center space for jamming between said first and closed second transverse elements means, responsive to said leading sharp edge of said bucket bottom, when lowered, engaging the ground to pivot said bucket and edge to an angle of tilt limited by the ratio of said center space vertical dimension to said jam bar means vertical dimension; and

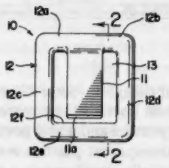
e. converter link means mounted on the back of said bucket for pivotally engaging the free end of said jam bar means with said second transverse element means open and said bucket is pivoted with the bottom and leading sharp edge normal to the ground for acting as a spreader of dirt.

4,096,655

FABRIC IDENTIFICATION TAG

Myron E. Ullman, Jr., 120 Sleepy Hollow, Canfield, Ohio 44406

Filed Jan. 24, 1977, Ser. No. 761,953
Int. Cl.[2] A44C *3/00*
U.S. Cl. 40—2 R **6 Claims**



1. A permanent fabric marking device comprising: an injection molded tag of resilient water resistant plastic including a body having top, bottom and side portions defining a central aperture; a tab molded to said top portion at an angle to the plane of said body having a width less than said aperture and a length greater than said aperture, being centered between said side portions and biasable through said central aperture by flexing; the free end of said tab being beveled on the inside edge to assist in biasing over said bottom portion; the outside edge of the free end of said tab and the outside edge of said bottom portion being opposed and wedge shaped to grip a fabric therebetween; wherein biasing said tab from its position

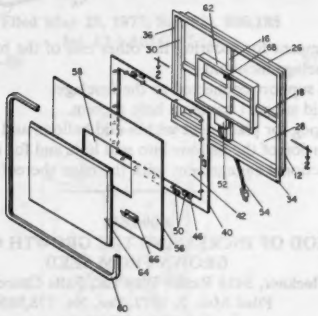
on one side of said body to a fabric gripping position on the other side of said body places said top portion of said body in torsion to urge said free end of said tab in pressure engaging contact against fabric sandwiched between said wedge shaped edges of said bottom portion and said free end of said tab.

4,096,656

LIGHTED MESSAGE BOARD CONSTRUCTION

Giacomo Diceglie, Box 252, Windermere, Fla. 32786

Filed Dec. 3, 1976, Ser. No. 747,358
Int. Cl.[2] G09F *13/00*
U.S. Cl. 40—564 **20 Claims**



1. A lighted message board comprising:
a support defined by a back and opposing side walls;
a sheet of an insulating material within said support and substantially parallel with said back;
a plurality of conductive layers deposited on one side of said sheet;
a plurality of lighting elements carried by said sheet, each lighting element interconnected with selected ones of said conductive layers;
means electrically connected with said conductive layers for energizing said lighting elements;
a transparent layer overlying said support across the extremities of said side walls;
means for binding the periphery of said transparent layer to the periphery of said side wall; and
a message panel carried by said transparent layer.

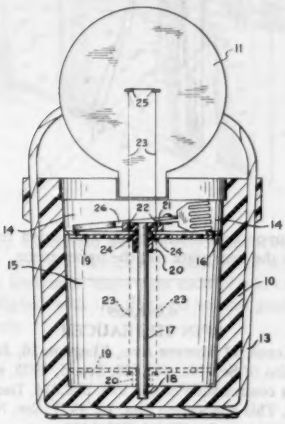
4,096,657

MINNOW BAIT KIT

George W. Morrow, 19 Rocco Dr., Little Rock, Ark. 72209

Filed Jun. 30, 1976, Ser. No. 701,321
Int. Cl.[2] A01K *97/04*
U.S. Cl. 43—56 **5 Claims**

1. A minnow bait kit for making accessible a submerged minnow and facilitating its attachment to a fishhook comprising:
a bucket having an enclosure in the shape of an inverted frustum of a cone, a flat bottom and a hinged lid swingable between an open and a closed position;
a horizontally disposed circular peripheral flange rigidly secured to the internal wall of said bucket, said flange projecting radially inward and dividing the enclosed space into a small dry upper compartment and a larger water-containing lower compartment suitable for containing submerged live minnows;
a single fixed guide post extending axially from the bottom of said bucket to an elevation above said flange;
a submergible perforated false bottom normally disposed coextensive with the bottom of said bucket, said false bottom being slidably mounted on said guide post and movable upwardly therealong for capturing a submerged minnow and conveying the minnow to an upper above-water position determined by the engagement of said false bottom with the lower surface of said inwardly projecting flange; said flange including a pair of diametrically opposed spokes coplanar with the circular portion thereof, said spokes extending inwardly from said circular portion to engagement with the upper end of said guide post;
a tongs adapted to pick a minnow from the up-raised false bottom, said tongs manually resting on the upper surface of said flange within said upper compartment; and
coupling means effective to lift said false bottom to said upper position coincident with the opening movement of said lid;
said coupling means including a crossbar mounted at the top of said guide post, said crossbar having a pair of vertically directed apertures radially spaced from opposing sides of said guide post, a flexible cord joined at its ends to said false bottom at locations spatially adjacent to opposing sides of said guide post and extending upwardly therealong in spaced relationship through said apertures to similarly spaced attachment fasteners secured to said hinged lid.



4,096,658

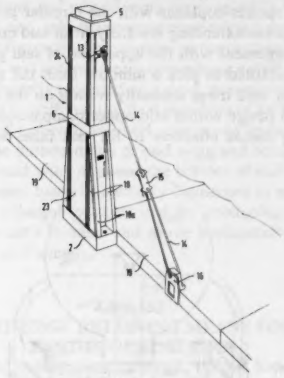
TOY MODEL VEHICLE TRACK SUPPORT SYSTEM

Hermann Neuhierl, Waldstrasse 36, D-8510 Fürth, Bayern, Germany

Filed Mar. 21, 1977, Ser. No. 779,602
Claims priority, application Germany, May 21, 1976, 2622824
Int. Cl.[2] A63H *33/06*
U.S. Cl. 46—17 **21 Claims**

1. A support system for track for toy model vehicles comprising paired pylons, said pylons being positioning one on each side of the track and connected together through means for supporting the track where it passes between the paired pylons, the pylons being formed from a plurality of substan-

tially flat elements including a base plate, an upper piece and side pieces which interlock both the base plate and the upper



piece, the supporting means being connected to the pylons intermediate the base plate and the upper piece.

4,096,659

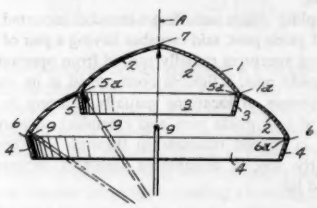
SPIN THE SAUCER

Eunice R. Keane, 11 Maeven Ave., Kingston 10, Jamaica

Continuation of Ser. No. 610,658, Sep. 5, 1975, abandoned, which is a continuation of Ser. No. 530,816, Dec. 9, 1974, abandoned. This application Jun. 14, 1977, Ser. No. 806,546

Int. Cl.[2] A63H *1/32*

U.S. Cl. 46—47 **9 Claims**



1. A toy for use with a wand, said toy comprising a hollow, generally dome-shaped shell having a wall with an inner and an outer surface; said wall defining an apex and said inner surface having a first lip defining a first opening; said wall extending from said first lip to a second lip defining a second opening; a first rim means extending from said inner surface at said first lip for engaging an end of said wand and for enabling rotating movement of said wand to cause said toy to spin about said wand; and a second rim means extending from said inner surface at said second lip for engaging an end of said wand and for enabling rotating movement of said wand to cause said toy to spin about said wand.

4,096,660

BALLOON POWERED AIRPLANE

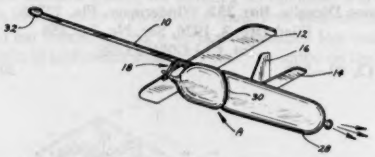
William H. Ralph, 301 N. Blackman Ave., Duluth, Minn. 55811

Filed Sep. 2, 1976, Ser. No. 719,852

Int. Cl.[2] A63H *27/06*

U.S. Cl. 46—76 A **1 Claim**

1. A toy balloon powered toy airplane comprising:
(a) a fuselage formed by a single piece rectilinear member and having,
(b) a wing secured thereto,
(c) a stabilizer mounted on said fuselage,
(d) a fin mounted on said fuselage,
(e) a balloon inflatable at one end thereof,
(f) means for securing the other end of the balloon to said fuselage adjacent said wing, and
(g) a loop connected to and depending from said fuselage and at a right angle thereto and through which said balloon extends for holding said balloon in alignment with said fuselage with said one end in position to power the airplane by expulsion of the balloon contents,



said means for securing the other end of the balloon to the fuselage including
(h) a support connected to the fuselage,
(i) said support having a hole therein,
(j) a peg for placement within said balloon and for forcing a portion of the balloon into said hole and for retaining it in frictional engagement with the edge thereof.

4,096,661

METHOD OF INCREASING THE GROWTH OF PLANTS GROWN FROM SEED

John Cleckner, 3414 Rustic Way La., Falls Church, Va. 22044

Filed Mar. 3, 1977, Ser. No. 773,985

Int. Cl.[2] A01N *7/00*

U.S. Cl. 47—58 **18 Claims**

1. In a method of growing crops from seed in non-irrigated fields in fertile soil suitable for growing the crop, the improvement which comprises applying only to that portion of the soil proximate the soil in which the seed is or is to be planted, during the period from about two weeks prior to planting to about six weeks after planting, a growth promoting amount of a linear alkyl sulfonic acid surfactant of at least 6 carbon atoms, or a non-phytotoxic salt thereof.

4,096,662

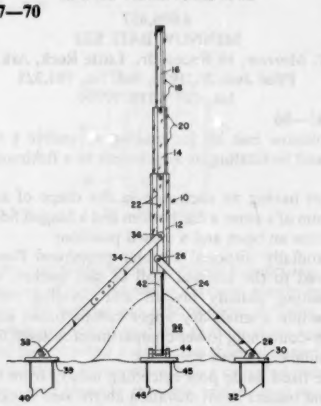
PLANT STAKE INCLUDING BASKET

Joseph Anderson, 1950 Kennedy Rd. #505, Scarborough, Ontario, Canada

Filed Jul. 19, 1976, Ser. No. 706,245

Int. Cl.[2] A01G *9/02, 9/12*

U.S. Cl. 47—70 **6 Claims**



1. A plant stake comprising telescopically adjustable post means having a base, at least 3 leg means extending from said base of said post means for supporting said base above ground

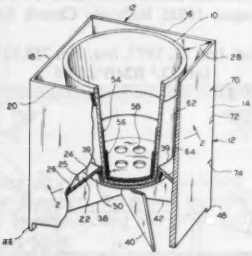
level, said leg means terminating in ground anchor means, basket means suspended from said stake for carrying tuberous plants, hoisting means on said stake for raising said basket means from a level beneath said post means to a level next adjacent said post means, said hoisting means comprising threaded shaft means, threaded shaft receiving means operatively engaging said shaft means, crank means for turning said shaft receiving means in relation to said shaft means, securing means on said shaft means for attaching said shaft means to said basket means.

4,096,663

PLANT WATERING SYSTEM AND PROCESS

Stanley Milton Silver, 1331 Lincoln Rd. #705, Miami Beach, Fla. 33319

Filed May 25, 1977, Ser. No. 800,185
Int. Cl.[2] A01G *27/00*
U.S. Cl. 47—80 **27 Claims**



1. An auto-moisturizing system for plants comprising an inner porous pot sealingly adhered near its lower end within a larger outer water-impermeable container for forming a reservoir between said pot and said container, whereby water in said reservoir may make contact with said pot and wicks by capillary action up the porous side walls of the pot, means for surfacing a lower interior part of the pot with a substantially water-impermeable coating extending from substantially the lowest level at which soil may be contained upward to a predetermined height on the side walls to control the elevation at which the wicking water may contact potted soil through the porous walls, and both said pot and said container being adapted to provide aerating means positioned at a lower region thereof.

4,096,664

SEAL TIGHT DOOR FOR WAREWASHER

Kenneth E. Perry, Wellesley, Mass., assignor to Adamation, Inc., Newton, Mass.

Filed Nov. 22, 1976, Ser. No. 743,932
Int. Cl.[2] E05D *15/56*
U.S. Cl. 49—235 **4 Claims**

1. In a warewasher having a housing which housing includes an outer wall, the improvement which comprises:

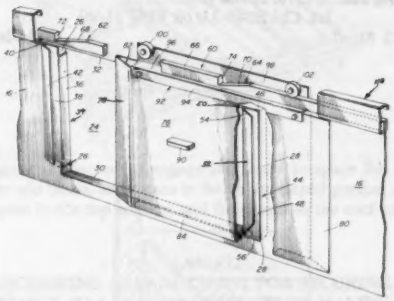
(a) a door frame formed in the wall of the housing, the frame including side edges, a top edge and a lower edge;

(b) first guide means secured to one of said side edges, said guide means formed in a longitudinal substantially U-shaped configuration;

(c) second guide means secured to the other of said side edges and formed in a longitudinal substantially U-shaped configuration;

(d) a horizontal sliding door having a leading edge and a trailing edge and adapted to move between a closed position and an open position, the leading edge adapted to mate in sealing engagement with the first guide means and the trailing edge adapted to mate in sealing engagement with the second guide means such that any water contacting the edges of the door will be directed downwardly; a bottom flange extending across the door and extending inwardly and downwardly whereby water is directed from the combination of the guide means and leading and trailing edges inwardly into the housing; and,

(e) a rail to support the door in a movable manner parallel to the upper edge of the door frame and including at least



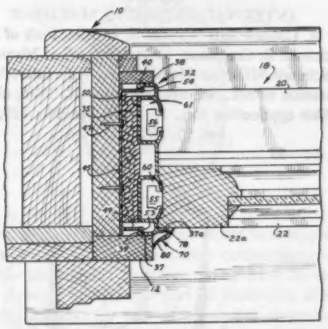
two stop cams, said cams disposed such that when the door is moved to the closed position the stop cams will prevent horizontal movement each of said cams substantially aligned with the first and second guide means respectively.

4,096,665

WINDOW SEALING STRUCTURE

Chester W. Ellingson, Jr., 13909 Frontier Ln., Burnsville, Minn. 55337

Filed Mar. 10, 1977, Ser. No. 776,127
Int. Cl.[2] E06B *7/16;* E05D *13/00*
U.S. Cl. 49—475 **5 Claims**



1. A weather seal structure for the juncture between a sash and the side of a window frame comprising

a rigid jamb member disposed in a window frame,

means holding said jamb member,

a projection integral with said jamb member extending between the sash and the adjacent side of said window frame,

a flexible strip weather seal member extending along said projection of said jamb member integral therewith,

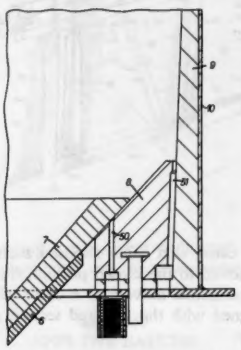
said seal member having a side portion thereof at one side of said projection bearing against said sash, and

said seal member having a portion at the other side of said projection bearing against said adjacent side of said window frame.

4,096,666
ROTARY SEALS

David Brown, Stevenage, England, assignor to Osro Limited, Hemel Hempstead, England

Filed Feb. 2, 1977, Ser. No. 764,988
Claims priority, application United Kingdom, Feb. 9, 1976, 5021/76; Jun. 2, 1976, 22842/76
Int. Cl.[2] B24B *31/10;* F16J *15/40*
U.S. Cl. 51—7 3 Claims

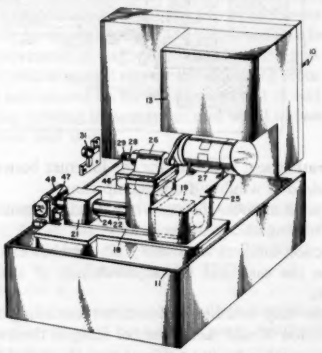


1. An abrasive, surface finishing machine comprising a stationary tub of generally cylindrical form and a rotary base, said tub and base having respective annular sealing members in mutual frictional contact, at least one of said members being of resiliently flexible material, and wherein the tub sealing member has a means defining a plurality of ports through it for the injection of a pressurised fluid coolant between the contacting, sealing surfaces of said sealing members, which surfaces are arranged to direct the injected coolant to the interior of said tub.

4,096,667
INTERNAL GRINDING MACHINE

Herbert R. Uhtenwoldt; Norman S. Humes, both of Worcester, and Richard E. Crossman, Leominster, all of Mass., assignors to Cincinnati Milacron-Heald Corp., Worcester, Mass.

Continuation of Ser. No. 676,041, Apr. 12, 1976, abandoned.
This application Aug. 17, 1977, Ser. No. 825,431
Int. Cl.[2] B24B *5/10*
U.S. Cl. 51—99 9 Claims

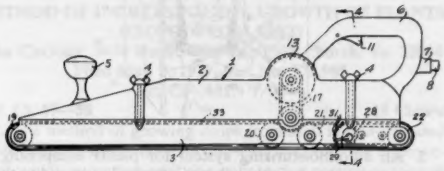


1. Internal grinding machine, comprising:
(a) a base having two spaced abutments,
(b) a primary bar extending between the abutments and mounted therein in hydrostatic bearings for rotation of the bar about an axis extending longitudinally of the bar and for movement of the bar in the direction of the axis,
(c) a wheelhead table fixedly fastened to the bar between the abutments and extending laterally thereof, said table including a wheelhead having a rotatable spindle on the end of which is carried an abrasive wheel,
(d) feed means located at a position substantially spaced from the primary bar for rotating the table and the bar together about the said axis, and
(e) an actuator operating on one end of the bar to move the bar and the table longitudinally along the axis, said actuator including a fluid cylinder providing the major longitudinal movements to the bar for bringing the grinding wheel toward and away from a workpiece and a mechanical actuator for oscillating the grinding wheel when it is in contact with the workpiece.

4,096,668
ENDLESS BELT SANDING TOOL

Raymond D. Logan, 10525 Bethesda Church Rd., Damascus, Md. 20750

Filed Jan. 12, 1977, Ser. No. 758,821
Int. Cl.[2] B24B *23/06*
U.S. Cl. 51—170 EB 10 Claims

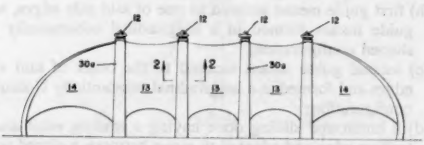


1. An endless belt sanding tool comprising:
(i) a body,
(ii) support means at spaced positions on said body,
(iii) two thrust means at spaced positions on said body between said support means and having a common tangential plane,
(iv) an endless sanding belt engaged for returning about said support means and engaged over said thrust means, and
(v) a driving roller journalled for rotation on said body and positioned with a peripheral portion thereof extending between said thrust means beyond said common tangential plane, to be contacted over an arc by the external face of a run of said belt intermediate the portions of the belt engaged over said thrust means.

4,096,669
MEMBRANE BUILDING SEGMENT CONNECTION

Alton L. Pabst, Sarasota, Fla., assignor to Seaman Corporation, Sarasota, Fla.

Filed Jul. 6, 1977, Ser. No. 813,319
Int. Cl.[2] E04B *1/347, 7/14*
U.S. Cl. 52—63 10 Claims



1. In a sealed joint structure connecting adjoining membrane segments, an upright truss member forming part of a supporting framework and having an outer chord, attaching clips mounted at intervals along the chord, and link means detachably connecting the side edges of two adjoining segments to said clips under tension, catenary hold-down cables extending

along the bottom edges of said segments and having their ends anchored to said framework, said link means comprising links adapted to detachably engage with like links for permitting the use of additional links facilitating progressively connecting the adjoining segments to the truss chord under decreased tension.

4,096,670

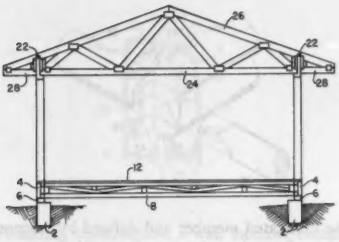
BUILDING STRUCTURAL SYSTEM

Ronald E. Fuller, P.O. Box 30485, Santa Barbara, Calif. 93105

Continuation-in-part of Ser. No. 619,372, Oct. 3, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 733,423

Int. Cl.[2] E04B *7/02*; E04C *3/02*

U.S. Cl. 52—90 **5 Claims**



1. A building structure system including interconnected girder and span members, the system incorporating interlocking means for interconnecting the girder and span members, said means comprising:

a wedge-shaped girder element with convoluted sides,

a wedge-shaped span element with convoluted sides, the convolutions of the girder element and the span element being shaped to nestle and interlock with one another,

the span element including a top portion shaped to rest upon the top portion of the girder element and to transfer the load of the span member to the girder member,

the girder element and the span element each being formed as two vertical half sections, the half sections being substantially the mirror images of one another, the half sections including a vertical web at substantially the mid-line of the wedge-shaped portions, the ends of the vertical web of the girder element bearing upon the main longitudinal girder members to assist in transferring the load borne by the girder element to the girder members and to assist in reinforcing the girder element, the vertical web of the span element being received between at least a portion of the vertical portions of the girder element, the span element incorporating reinforcing plates at the top portion,

the girder element and span element being formed from sheet metal sections bent to the shape of the respective elements,

means attaching the girder element to the girder member, and

means attaching the span element to the span member, the span and girder elements being connected to their respective members such that when the members are attached to one another, the wedge-shaped interlocking portions point in a generally vertical direction, these convolutions both being sinusoidal-shaped in cross-section.

4,096,671

ROOF EAVE ASSEMBLY

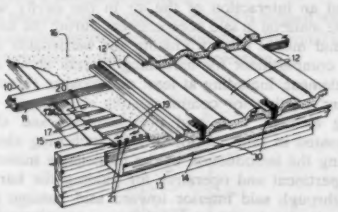
Raymond Joseph Aarons, Jindalee, Australia, assignor to Monier Colourtile Pty. Ltd., Darra, Australia

Filed Jun. 9, 1977, Ser. No. 804,880

Int. Cl.[2] E04B *7/00*; E04D *1/00*

U.S. Cl. 52—94 **7 Claims**

1. In a tiled roof having a fascia, rafters and sarking material, a roof eave assembly comprising a sarking support of thin sheet material including a normally sloped portion to lie beneath the tiling and sarking and to extend over said fascia and a downward flange to lie in front of the fascia, integral spacing means on said sarking support laterally spaced from the downward



flange and adapted to engage the fascia to space the flange from said fascia, and means to fasten the sloped portion of said support to the top edge of said fascia and to the roof rafters.

4,096,672

ANCHORING ARRANGEMENT FOR SECURING AN OBJECT TO A SUPPORT STRUCTURE HAVING AN INTERNAL CAVITY

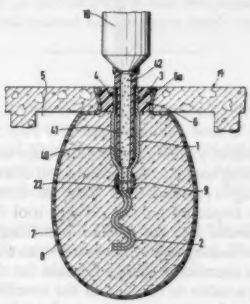
Artur Fischer, and Klaus Fischer, both of Tumlingen, Waldachtal, Germany, assignors to Artur Fisher, Tumlingen, Waldachtal, Germany

Continuation-in-part of Ser. No. 631,153, Nov. 11, 1975, Pat. No. 4,044,512. This application Oct. 14, 1976, Ser. No. 732,447

Claims priority, application Germany, Oct. 25, 1975, 2547823; Nov. 3, 1975, 2548979; Nov. 13, 1975, 2550954; Mar. 27, 1976, 2613178; Nov. 14, 1974, 2453957; May 26, 1975, 2523198; Jun. 6, 1975, 2525220; Jun. 17, 1975, 2525452; Jun. 14, 1975, 2526744; Jun. 21, 1975, 2527773

Int. Cl.[2] E04B *1/41*; E04C *5/12*

U.S. Cl. 52—127 **17 Claims**



1. An arrangement for securing an object to a support structure having an anchoring hole which communicates with a cavity within the support structure, comprising an elongated anchoring element having one part of transverse dimensions smaller than, and another part of transverse dimensions substantially corresponding to those of the anchoring hole so that said anchoring element is insertable into the anchoring hole through an open end thereof until a leading end portion of said one part extends into the cavity and said other part supports said anchoring element at the open end of the anchoring hole and closes the latter, said anchoring element having an interior bounded by an internal surface and extending between said leading and a trailing end portion of said anchoring element; and means for forming a plug about at least said leading end portion of said anchoring element to thereby attach the latter to the support structure and to prevent the extraction thereof from the anchoring hole, including a bag-shaped limiting member mounted on the inserted anchoring element so as to surround at least said leading end portion of the latter and define therewith a compartment for accommodating a body of hard-

enable material for hardening therein, and being impermeable to the hardenable material to prevent the latter from escaping from said compartment into the cavity, and gas-permeable to permit venting of excess air from said compartment into the cavity and an interaction of the air in the cavity with the hardenable material in said compartment during the hardening thereof, and means for introducing the hardenable material into said compartment for hardening therein about said anchoring element, including at least one passage through said leading end portion for communicating said interior of said anchoring element with said compartment, and shielding means situated in said interior of said anchoring element at least during the introduction of the hardenable material into said compartment and operative for guiding the hardenable material through said interior toward said passage and for preventing the hardenable material from contacting said internal surface of said anchoring element at said trailing end portion thereof.

4,096,673

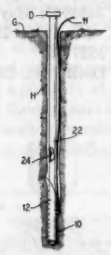
METHOD OF ANCHORING

Robert F. Deike, Cheyenne, Wyo., assignor to Foresight Industries, Cheyenne, Wyo.

Division of Ser. No. 668,695, Mar. 19, 1976, Pat. No. 4,044,513, which is a continuation-in-part of Ser. No. 535,428, Dec. 23, 1974, Pat. No. 3,969,854. This application Nov. 11, 1976, Ser. No. 740,946

Int. Cl.² E02D *5/80*

U.S. Cl. 52—156 **4 Claims**



1. The method of forming a ground anchor which comprises inserting a driving tool into the trailing end of a hollow tubular member having a driving end with an internal abutment adapted to be impacted by the driving tool for forcing the member lengthwise into the ground, providing an out-turned lip on the open trailing end of the member as a continuation of one side of the member to form a fulcrum for tilting the member, attaching a cable to the side of the member opposite the out-turned lip side, impacting the tool against said internal abutment for driving the tubular member with the cable attached to a desired depth in the ground, pulling the cable to rotate the tubular member transversely of the hole formed by the driving operation, filling the hole with concrete, tensioning the cable to center it in the column of concrete above the tubular member, compressing the concrete column to compact the ground surrounding the hole and to fill voids in the ground with concrete, and setting the concrete around the tensioned cable to form a compression loaded concrete column.

4,096,674

FALSE TENON STRUCTURE

Ernest Paul Kollar, and Julie Ann Kollar, both of Rte. 1, Box 221-B3, Longmont, Colo. 80501

Filed Aug. 26, 1977, Ser. No. 827,995

Int. Cl.² E04B *1/10*

U.S. Cl. 52—233 **8 Claims**

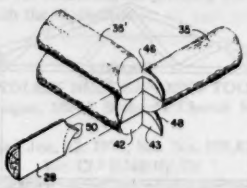
1. A false tenon for use at the intersection of first and second planar structural surfaces which meet at a given angle with each of the structural surfaces having thereon facade members of a thickness "*t*" representing stacked members of a predetermined cross-section, the false tenon comprising;

an elongated member of the full, predetermined cross-section configuration;

a cradle of a shape adapted to receive the predetermined cross-section defined around a cradle axis transversely through and adjacent to one end of the elongated members;

a first tenon planar surface adapted to interface with the first planar structural surface defined at the end of the false tenon and intersecting the surface defining the cradle at a line parallel to the cradle axis; and

a projection having a thickness of "*t*" extending from the end of the elongated member substantially in the direction



of the elongated member and defined by a second tenon planar surface adapted to interface with the second planar structural surface which intersects the first tenon planar surface at an angle substantially that of the given angle of the intersection of the planar structural surfaces and at a line substantially perpendicular to the line of intersection of the first tenon planar surface and the cradle surface, a surface extending as a continuation of the cradle surface and having a configuration substantially that of a portion of the predetermined cross-section, and the surface of the elongated member;

whereby false tenons may be stacked with alternating false tenons formed in mirror image fashion to provide the appearance of full predetermined cross-section stacked members.

4,096,675

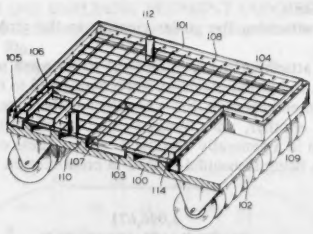
SPLIT-SLAB HOUSE CONSTRUCTION

John R. Howard, Houston, and Robert W. Loomis, Freeport, both of Tex., assignors to Next Generation Housing Corporation of America, Houston, Tex.

Filed Aug. 25, 1976, Ser. No. 717,747

Int. Cl.² E04B *1/343*

U.S. Cl. 52—79.1 **34 Claims**



1. A method of erecting a house comprising the steps of

constructing a transportable concrete first slab having a lower surface at a factory site,

constructing a superstructure upon said first slab, preparing a mating site for said first slab on a lot remote from said factory site, said mating site having an upper surface,

transporting said first slab and superstructure to said mating site, and

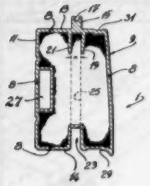
mating said lower surface of said first slab with said upper surface of said mating site such that there are no substantial air gaps between said lower surface of said first slab and said upper surface of said mating site and such that said first slab becomes substantially integrated with said mating site.

4,096,676

WALL MEMBER

Maurice Hibert, 6250, Bienville St., apt. A205, Brossard, Quebec, Canada

Filed Jul. 18, 1977, Ser. No. 816,678
Int. Cl.[2] E04B *5/48, 1/00*
U.S. Cl. 52—220 11 Claims



1. In a building construction, a wall member comprising:
an elongated substantially rectangular extruded shell defining an inner core, said shell being made of low heat expandable material;
said shell being formed with two substantially vertical faces;
one said vertical face having a permanent building exterior or interior finish;
the other vertical face having a permanent building interior finish,
said shell being additionally formed with two substantially horizontal upper and lower faces wherein said upper face of said shell is provided with a longitudinal tongue, a pair of fins being formed inside said shell opposite said tongue, the space between said fins corresponding to the thickness of said tongue, a groove being formed in said lower face of said shell, said groove to receive a tongue of an adjoining wall member, said tongue, said pair of fins and said groove all being centrally aligned to enable grooving of the ends of said wall member between said fins and including said tongue, said grooving thus producing a channel to permit engagement of said wall member with a structural member;
said shell having its inner core filled with an insulating material.

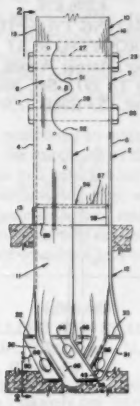
4,096,677

POST BASE

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Jun. 13, 1977, Ser. No. 805,638
Int. Cl.[2] E02D *27/00*
U.S. Cl. 52—297 4 Claims

1. A post base formed from a sheet metal comprising:
a. a strip of metal having a length several times greater than its width, and having a leading edge and a trailing edge, and having first and second ends;
b. said strip of metal consists of a mid-portion adapted for embedment in a concrete foundation and end portions adapted for connection to a wood post;
c. said metal strip adjacent said leading edge is formed with at least one opening at said first end for receiving a fastener therethrough and said leading edge adjacent to each of said openings is formed with additional metal forming a first projection and said trailing edge at said first end is formed with cut-out portions of substantially equal size and configuration to said first projections;
d. said metal strip adjacent said trailing edge at said second end is formed with at least one opening for receiving a fastener therethrough and said trailing edge adjacent to each of said openings is formed with additional metal forming a second projection;
e. said leading edge at said second end is formed with at least one cut-out portion which is substantially equal in size and configuration to said second projection.



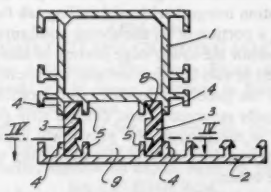
f. said strip of metal is folded at an approximately 90° angle at its mid-point along the short side of said strip of metal and is folded at an approximately 45° angle along said short side along two lines equidistant from said mid-point and parallel to said mid-point fold line; and
g. said strip of metal is folded at an approximately 90° angle at approximately the mid-point of said strip along the longer side of said strip from said two equidistant lines to said first and second ends forming angle members.

4,096,678

INSULATED CONSTRUCTION ELEMENT

Manfred Diels; Karl Wilhelm Dienstuhl, both of Meinerzhagen; Tilo Jäger, and Eitel Hocker, both of Bielefeld, all of Germany, assignors to Otto Fuchs KG., Meinerzhagen and Schüco Heinz Schurmann GmbH & Co, Bielefeld, both of Germany

Filed Nov. 22, 1976, Ser. No. 744,177
Claims priority, application Germany, Nov. 25, 1975, 2552700
Int. Cl.[2] E04B *1/62*
U.S. Cl. 52—403 13 Claims



1. A construction element comprising:
an elongated bar having a pair of longitudinally extending sides and formed along each of said sides with a longitudinally extending recess having a laterally directed face;
a pair of elongated metallic profiles each formed with a pair of flanges forming a respective groove receiving a respective side of said bar, at least one of said flanges of each of said pairs being plastically deformed into the respective

recess and having a face bearing on the face of the respective recess;

a coating on at least one of said faces; and

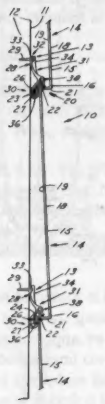
particles imbedded in and projecting from said coating, whereby the coefficient of friction between said bar and said profiles is greatly increased at said recesses.

4,096,679

SELF-COMPENSATING TWO-PIECE SIDING OR ROOFING SLAT

Paul Naz, 20502 Harper, Harper Woods, Mich. 48225

Filed May 27, 1977, Ser. No. 801,229
Int. Cl.[2] E04D *1/34*
U.S. Cl. 52—551 **9 Claims**



1. An interlocking slat assembly for use as siding, roofing and the like to cover surface areas of buildings comprising:

a surface-covering panel including a generally L-shaped anchoring configuration integral with a lower edge portion thereof and a generally hook-like slide configuration integral with the opposite edge portion thereof; and

a separate attachment strip of substantially the same width as said panel for securing said panel to said building surface so as to prevent "oil canning" caused by expansion and contraction, said attachment strip including a nailing tab adapted to be fixedly secured to said building surface by fastening elements, a generally C-shaped passage-defining configuration integral with said nailing tab for laterally telescopically receiving said slide configuration therein to secure the upper edge portion of said panel to said attachment strip so as to provide compensation for expansions and contractions and a generally U-shaped groove-defining formation integral with said nailing tab for engagably receiving a portion of an anchoring configuration therein so as to anchor the lower edge portion of another panel to be attached to said building surface, the anchoring configuration of the panel whose slide configuration is laterally telescopically received in said defined strip passage being anchored in the groove of a previously installed slat assembly for interlocking said slat assemblies together one above the other,

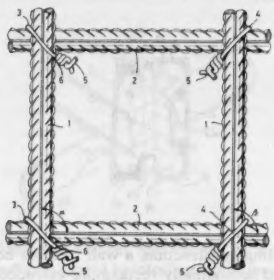
said nailing tab including corrugation means having alternative ridge and valley portions perpendicular to the width of said nailing tab for engagably receiving fastening means therethrough for fixedly securing said attachment strip to the surface of said building being covered, said corrugation means cooperating with said building surface being covered and said fastening elements for compensating for expansion and contraction of said strips with changing weather conditions and for achieving a spring-type buckle washer effect for maintaining a tight fit therebetween thereby preventing said slat assembly from working loose and eliminating rattling and the like.

4,096,680

REINFORCEMENT GRID FOR STEEL CONCRETE CONSTRUCTION

Klaus Ritter; Gerhard Ritter, and Josef Ritter, all of Graz, Austria, assignors to Firma AVI Alpenlandische Veredelungs-Industrie Gesellschaft mbH., Graz, Austria

Filed May 9, 1977, Ser. No. 795,040
Claims priority, application Austria, May 7, 1976, 3378/76
Int. Cl.[2] E04C *2/42*
U.S. Cl. 52—665 **7 Claims**



1. A reinforcement grid for steel concrete construction, consisting essentially of longitudinal and transverse rods crossing one another at right angles, said transverse and longitudinal rods being tied together at a sufficient number of their crossing points to provide said grid with rectangular stability, each of said tieings being by means of a loop formed by twisting the ends of a piece of wire together, the planes of half of the loops thus formed being 90° away from the planes of the remaining loops, the loops in the said former planes and the loops in said latter planes being uniformly distributed in said grid.

4,096,681

FASTENER FOR RETAINING SHEET CLADDING

Sture Netterstedt, and Bengt Lindstrand, both of Fagersta, Sweden, assignors to Rostfria Tak Aktiebolag, Fagersta, Sweden

Continuation-in-part of Ser. No. 677,986, Apr. 19, 1976, abandoned. This application Jan. 21, 1977, Ser. No. 761,311
Claims priority, application Sweden, May 2, 1975, 7505117
Int. Cl.[2] E04B *1/38*
U.S. Cl. 52—713 **2 Claims**

1. A composite fastener for retaining sheet cladding, such as a roof or wall sheeting, with outstanding flange joints, comprising a plate having an anchoring portion formed with a bent end intended for attachment to a substructure and a fastening portion lying generally at right angles to the anchoring portion, which is intended to be united with the outstanding flange of the sheet, said plate being made of hard-rolled one-layer thin sheet of stainless steel with a thickness of 0.05 to 0.15 mm., so that it can be seam-welded to the outstanding flanges in conjunction with welding these together without the continuity of the welding seam being broken, said anchoring portion being reinforced by means of a separate doubling plate of stainless steel, which is softer and thicker than the hard-rolled sheet

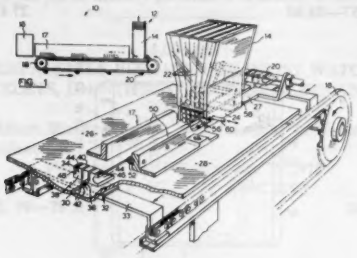
forming said plate, said doubling plate lying on an exterior surface of the anchoring portion, curved about said bent end and being welded to said anchoring portion.

4,096,682

BUNDLING OF CIGARETTES

Michael H. Sheahan, Toronto, Canada, assignor to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Division of Ser. No. 663,144, Mar. 2, 1976. This application Dec. 27, 1976, Ser. No. 754,414
Int. Cl.[2] B65B *19/10*
U.S. Cl. 53—149 10 Claims



1. Apparatus for the formation of a nested group of cigarettes consisting of three rows of cigarettes the central row of which contains one less cigarette than the other two rows, which comprises:

a hopper for dispensing downwardly cigarettes in parallel rows to an assembly station,

a horizontal support platform at said assembly station to receive said dispensed rows of cigarettes thereon,

an elongate channel extending from said assembly station towards a wrapping station for conveying a group of three rows of cigarettes therealong,

said elongate channel comprising a generally flat bottom surface coplanar with said platform and parallel side walls upstanding from said bottom surface a distance at least equal to the depth of the group of cigarettes, said side walls being spaced apart the width of said group of cigarettes,

a first elongate protrusion on one of said side walls extending longitudinally from said assembly station towards said wrapping station,

said first protrusion being dimensioned so that its maximum vertical thickness is equal to the diameter of a cigarette of said group and it protrudes from said one wall towards said other wall a distance equal to the diameter of a cigarette in said group, adjacent said assembly station and for a distance therefrom at least equal to the length of a cigarette in said group, said first protrusion thereafter tapering longitudinally thereof to a dimension substantially equal to the radius of a cigarette in the group,

said first protrusion having a lower surface spaced from said bottom surface a distance equal to the diameter of a cigarette in said group,

a second elongate protrusion on the other of said walls extending longitudinally from a position part way along the length of said first protrusion towards said wrapping station and corresponding to the position along the length of said first protrusion of commencement of said tapering thereof,

said second protrusion being dimensioned so that it protrudes from said other wall a distance increasing from its upstream end to a maximum dimension substantially equal to the radius of a cigarette in said group at its downstream end which coincides with the downstream end of said first protrusion,

said second protrusion having a lower surface spaced from said bottom surface a distance at least the diameter of a cigarette in said group,

said first and second protrusions cooperating to displace the centre row of cigarettes in a group a distance equal to the radius of a cigarette in that row during movement of said group along said channel past said protrusions, and

pusher means for pushing said group of cigarettes longitudinally thereof out of said assembly station and along said channel towards said wrapping station,

said pusher means comprising a substantially vertical cigarette group-engaging surface, said surface having an opening at one side thereof corresponding to said one wall and dimensioned to allow the passage of a cigarette therethrough,

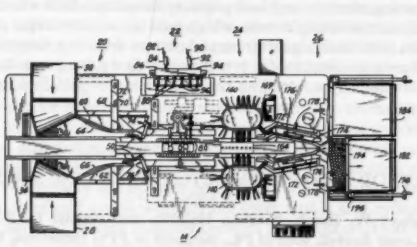
said surface being positioned to engage all the cigarettes in said group with the exception of the one cigarette on the centre row at the end of said row corresponding to said one side of said surface, whereby, when said pusher moves said group of cigarettes out of said assembly station said one cigarette remains in said assembly station as the opening in said surface by-passes said one cigarette.

4,096,683

AMPOULE FILLING AND SEALING MACHINE

John F. McMickle, Jr., Piscataway, N.J., assignor to Cozzoli Machine Company, Plainfield, N.J.

Filed Feb. 16, 1977, Ser. No. 769,188
Int. Cl.[2] B65B *5/10, 23/22, 3/00*
U.S. Cl. 53—244 30 Claims



5. An empty-ampoule feeding station of an ampoule filling and sealing machine comprising an inclined tray to receive empty ampoules base down, a belt having a horizontal reach below the lower edge of said tray, movable means having a vertical reach above said horizontal reach, and means to move the reach of said belt horizontally toward the filling station, so that empty ampoules sliding downwardly on said inclined tray onto said reach are moved toward the filling station by the reach of said belt and said movable means.

4,096,684

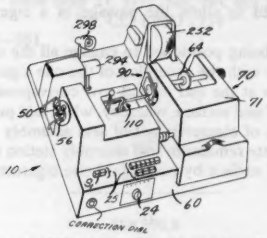
AUTOMATIC LENS GRINDING MACHINE

Hayao Akaba, Akishima; Akira Ikeda, Fussa, and Masayoshi Lee, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Hoya Lens, Tokyo, Japan

Continuation-in-part of Ser. No. 490,188, Jul. 19, 1974, abandoned. This application May 27, 1976, Ser. No. 690,781
Claims priority, application Japan, May 30, 1975, 50-114211
Int. Cl.[2] B24B *9/14*
U.S. Cl. 51—101 LG 13 Claims

1. An automatic lens grinding device comprising a base; a glasses frame supporter rotatably mounted to said base and being provided with a circular opening slightly larger than an inner periphery of one side of the glasses frame; a plurality of devices mounted on said supporter for securing the glasses frame to said supporter in front of said circular opening; a profile tracing guide pin for tracing the inner periphery of said glasses frame, said pin being attached on one end of a shaft and moving a cam at the other end of the shaft; a slidable working

table containing a plurality of gears, slidable to forwardly and rearwardly parallel to said supporter; first drive means for moving said slidable working table; coaxial rotary shafts supporting a lens to be ground therebetween; a recording assembly mounted to an extension of said one of said shafts, said recording assembly being provided with a recording substrate; second drive means for rotating driving shafts and said recording plate through said plurality of gears; a grinding stone aligned with said slidable working table; third drive means for driving said grinder stone; a pressure detector for detecting



contact pressure between said grinding stone and for generating an electrical signal corresponding to the detected pressure; a pattern detecting element for detecting the absence or presence of a pattern recorded on said recording substrate and control circuit means for receiving signals from said pattern detecting element and said pressure detector which are then put into a selecting circuit, which puts out a value larger than either one of said signals from said pattern detecting element or said pressure detector for actuating said first drive means drive circuit thereby controlling the functioning of said first drive means.

4,096,685

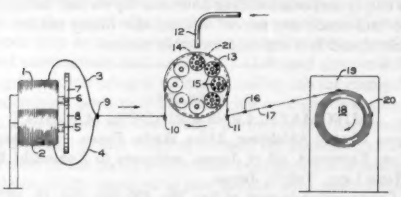
METHOD AND APPARATUS FOR PRODUCING SLUBBY YARN

Herbert W. Barch, Natrona Heights, and August G. Bohy, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 639,723, Dec. 11, 1975, abandoned, which is a division of Ser. No. 582,493, May 30, 1975, abandoned. This application Dec. 9, 1976, Ser. No. 749,198

Int. Cl.[2] D02G 3/34

U.S. Cl. 57—34 B **33 Claims**



1. A method of providing a slubby strand of fibers comprising forming a low tension portion of said strand, passing the strand through a slubbing tool having an interior surface, introducing onto the surface of the tool a fluid at high pressure continuously while said strand is within said tool, both intermittently twisting and bulking the strand within said tool as the fluid passes through the strand, rapidly passing the strand so twisted and bulked from said slubbing tool, and collecting from said slubbing tool a strand having slub thereon.

14. An air jet for forming twisted slubby yarn which comprises a hollow body having an interior surface and a nozzle having an end portion through which fluid is directed onto said surface comprising two spaced circular portions, said spaced circular portions being arranged to direct said fluid such that a pair of fluid vortices are created approximately perpendicular to said interior surface and approximately perpendicular to the line of passage of said strand through said hollow body.

4,096,686

FEED DEVICE FOR OPEN-END SPINNING ASSEMBLY

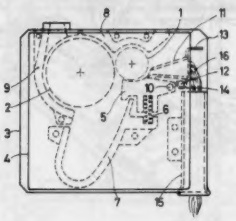
Fritz Stahlecker, Bad Uberkingen, and Hans Raasch, Monchengladbach, both of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of Germany

Filed Mar. 14, 1977, Ser. No. 777,561

Claims priority, application Germany, Apr. 2, 1976, 2614182

Int. Cl.[2] D01H 1/12

U.S. Cl. 57—58.95 **27 Claims**



1. Feeding apparatus for a spinning assembly comprising:

a transport arrangement for delivering sliver to an opener device and which forms a nip for the sliver presented to the opener device,

a housing surrounding said transport arrangement,

a sliver funnel disposed upstream of said transport arrangement, said sliver funnel having an outlet opening which leads to the transport arrangement,

and sliver funnel guide means for supportably guiding said sliver funnel for movement between an operating position with said outlet opening in the vicinity of the transport arrangement and a servicing position with said outlet opening exposed to the outside of said housing for accommodating visual inspection of the position of the sliver inserted in the sliver funnel without requiring opening of said housing, said sliver funnel guide means including means for supporting said sliver funnel in each of its operating and servicing positions,

whereby sliver can be laid correctly in said sliver funnel without requiring opening of said housing for the transport arrangement.

4,096,687

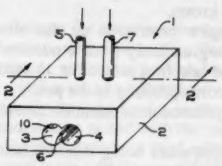
METHOD FOR PRODUCING SLUBBED YARNS

Alan T. McDonald, Cranberry, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 4, 1977, Ser. No. 793,673

Int. Cl.[2] D02G 1/16, 1/20

U.S. Cl. 57—157 F **4 Claims**



1. A method for forming a randomly slubbed yarn comprising passing a textile yarn through a fluid jet having a pair of passageways along its length, said passageways being intercon-

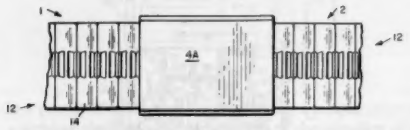
nected and overlapped along their lengths and having at least one fluid inlet in fluid flow communication therewith, introducing the strand into one of said passageways while directing a fluid circumferentially around said passageway at a first pressure to thereby treat said yarn with said fluid while moving the strand around the wall of said passageway, passing said yarn to said second passageway while directing a fluid circumferentially around said second passageway at a second pressure in the opposing direction to said directing of said fluid in said first passageway to thereby treat said yarn with said fluid in said second passageway while moving the strand around the wall of said second passageway and alternating said yarn between said passageways in a random pattern during its passage through the jet to thereby produce a randomly slubbed yarn.

4,096,688

EXPANSIBLE LINKAGE FOR WRIST WATCH BRACELETS, IDENTIFICATION BRACELETS AND THE LIKE

Kurt Albert Rieth, Warwick, R.I., assignor to Textron Inc., Providence, R.I.

Filed Apr. 15, 1977, Ser. No. 787,975
Int. Cl.² F16G *13/24;* A44C *5/18*
U.S. Cl. 59—79 R **10 Claims**



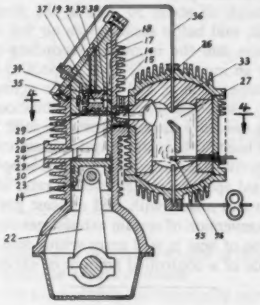
1. In an expansible linkage including in combination,
at least two sections of expansible linkages each of which comprises
a row of top links and a row of bottom links,
means interconnecting the links of each row with the links of the other row to provide displacement of the links relative to each other when the expansible linkage section is stretched longitudinally from a contracted to an expanded position, and
resilient means associated with said links for resisting the displacement of said links and for returning them from expanded to contracted positions upon release of the longitudinal stretching force,
the improvement comprising,
a channel shaped outer member which comprises a top wall, a pair of spaced side walls and a series of aligned perforations extending thru said side walls,
first spring pin means connected to one end of one of said expansible sections having the outer ends of its trunions extending into a first selected pair of said aligned perforations,
second spring pin means connected to one end of the other of said expansible sections having the outer ends of its trunions extending into a second selected pair of said aligned perforations which are spaced longitudinally from said first pair,
a one-piece inner member which comprises a bottom wall and a pair of spaced upwardly extending side members and
means for detachably connecting said upwardly extending side members to said side walls of said channel shaped outer member substantially midway between the ends of said outer member,
whereby said inner member closes the opening between the lower ends of the side walls of said channel shaped outer member, said ends of said expansible linkage sections are positioned between the top wall of said channel shaped outer member and the bottom wall of said inner member and the trunions of the first and second spring pin means can be depressed from the exterior of the channel shaped outer member to adjust the length of the linkage.

4,096,689

HEATING CHAMBER SEAL PROVIDED IN A HEATING CHAMBER COMBUSTION ENGINE

Georg Karl Buergel, 6 Stone Rd., Plainview, N.Y. 11803

Filed Oct. 26, 1976, Ser. No. 735,825
Int. Cl.² F02G *3/02;* F15B *15/20*
U.S. Cl. 60—39.63 **9 Claims**



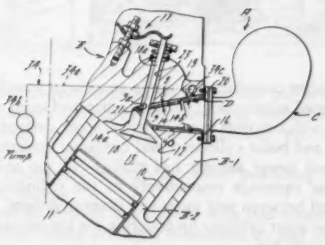
1. In a combustion engine comprising a housing, a cylinder defined within said housing, a piston disposed for movement sithin said cylinder, a heating chamber defined within said housing, a fuel inlet and fuel igniting means in said heating chamber, a passageway disposed within said housing connecting said heating chamber and said cylinder interior adjacent the cylinder head; that improvement including an extension of said piston for slidable movement on the wall of said cylinder above said piston, an opening provided in said extension constructed and arranged so that the opening in the extension and said passageway line up with one another solely in the highest position of said piston whereby the gases within said cylinder pass into said heating chamber through said passageway at the end of the compression stroke and return from said heating chamber to said cylinder through said passageway at the beginning of the down stroke of said piston in a reciprocating motion.

4,096,690

LOUVERED EXHAUST PORT LINER

James J. Florek, Troy, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1976, Ser. No. 754,661
Int. Cl.² F01N *3/10*
U.S. Cl. 60—282 **5 Claims**



1. In an internal combustion engine having a cast housing containing at least one combustion chamber and at least one passage effective to conduct combusted gases from said cham-

ber, said passage having cylindrical walls extending between an entrance and an exit, the combination comprising:

(a) walls defining an annular mounting surface about the exit of said passage,

(b) a unitary sheet metal cylinder having an annular flange effective to be mounted against said surface, said cylinder having a body extending from said flange into and through said passage terminating adjacent said inlet, said body being spaced from said passage a distance of at least 0.035 inch except for the flange contact, said cylinder having one or more apertures therein and an integral baffle bent inwardly at the leading edge of each aperture, said baffle extending inwardly from the wall of said cylinder at an angle of about 30° and in the direction of the passage exit, said baffle acting as an air foil whereby the exhaust gases and the incoming secondary air are both directed at an inward angle with respect to the cylinder wall for proper mixing, and said baffle acting as a flame holder for sustaining secondary combustion, said apertures being spaced a distance from the inlet edge of said cylinder at least 70% of the length of said cylinder, and

(c) means effective to convey a continuous supply of secondary air to said aperture at a controlled rate, whereby air is drawn into and mixed with said exhaust gas to facilitate chemical conversion of certain exhaust gas constituents by the retention of heat in said gases within said liner and by the presence of a controlled amount of excess oxygen.

4,096,691

CATALYST CONTAINER FOR USE IN EXHAUST MANIFOLD

Hidetaka Nohira; Hironori Bessho, and Yasuyuki Sakai, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

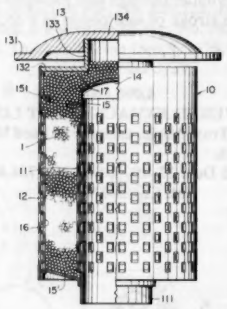
Continuation-in-part of Ser. No. 645,783, Dec. 31, 1975, abandoned. This application Jul. 12, 1976, Ser. No. 704,509

Claims priority, application Japan, Jun. 4, 1975, 50-66402; Sep. 26, 1975, 50-130998[U]

The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.

Int. Cl.[2] F01N *3/15*

U.S. Cl. 60—295 **5 Claims**



1. A catalyst container, for use in an exhaust manifold, having perforated substantially vertically disposed inner and outer cylinders, with catalysts in a cylindrical space defined between said inner and outer cylinders, said container comprising:

upper and lower annular lids closing the top and bottom annular openings respectively of the cylindrical space defined between said inner and outer cylinders;

a circular inner cylinder lip covering the top opening of said inner cylinder;

an outer cylinder lid on the top circumferential edge of said outer cylinder covering the top opening of said outer cylinder and said circular inner cylinder lid, said outer cylinder lid including an annular portion, a cylindrical portion having a threaded outer circumferential surface, and an outer cover portion, means defining a cavity having a threaded wall in said outer cover portion, and said outer cover portion being removably threadedly fitted on said threaded outer circumferential surface of said cylindrical portion, said outer cylinder lid and said inner cylinder lid defining a first space therebetween; and

means defining a hole in said upper annular lid through which the first space is communicated with the cylindrical space defined between the inner and outer cylinders.

4,096,692

AIR-PUMP SYSTEM FOR RECIPROCATING ENGINES

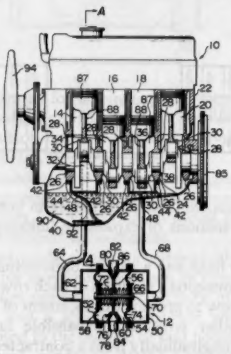
Hirokazu Nakamura; Tsuneo Ohinouye, both of Kyoto; Kenji Hori, Nagaokakyo; Tatsuro Nakagami, Kyoto; Yutaka Tsukamoto, Jyoyo, and Katsuo Akishino, Kameoka, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 27, 1976, Ser. No. 718,329

Claims priority, application Japan, Apr. 15, 1976, 51-47391[U]; May 28, 1976, 51-69427[U]

Int. Cl.[2] F01N *3/10*

U.S. Cl. 60—307 **5 Claims**



1. A multicylinder engine, partition and air pump system, comprising:

a cylinder block having therein a plurality of cylinders each with a piston reciprocable therein, the block also having a plurality of division walls extending from the cylinders to provide crank chambers each communicating with one of the cylinders, the walls having bearings therein for a crankshaft to be rotated by the pistons, and the block having an oil pan at a bottom thereof;

a partition plate for at least one of the crank chambers in the cylinder block, the plate being secured to lower portions of the division walls of the respective chamber to separate that chamber from the other crank chambers and from the oil pan; and

an air pump having a variable-pressure chamber communicating with the separate crank chamber, also having an air-pressure chamber which has an inlet communicating with the atmosphere, an outlet for supplying atmospheric air to condition an exhaust of the cylinders, and controls for the inlet and outlet, the air pump having a pump member responsive to differentials of pressure between said pressure chambers, and spring means for urging the pump member to move from one of the pressure chambers toward the other, the spring means having an oscillation frequency natural thereto whereby it is resonant with a predetermined and relatively low frequency at which the pistons reciprocate in the cylinders and supply air at variable pressure through the separate crank chamber to the variable-pressure chamber of the air pump, to render the air pump ineffective when the pistons reciprocate at a

relatively high frequency, subject to renewed operation of the air pump with the pump member moving resonant to the relatively low frequency when the pistons again reciprocate at said relatively low frequency.

4,096,693

TORQUE CONVERTER FLUID CONTROL SYSTEM FOR POWER TRANSMISSION SYSTEM

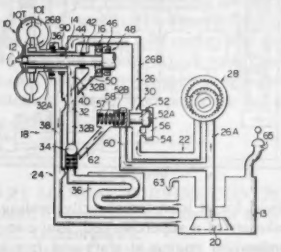
Tamio Kawamoto, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 12, 1977, Ser. No. 786,827

Claims priority, application Japan, Apr. 12, 1976, 51-44425[U]

Int. Cl.² F16D *33/00*

U.S. Cl. 60—337 **4 Claims**



1. In a power transmission system having a torque converter unit, a driving shaft drivably connected to the impeller of said torque converter unit, a driven shaft drivably connected at one end thereof to the turbine of said torque converter unit, and a bearing mounted on said driven shaft at a location axially spaced apart from said one end,

a torque converter fluid control system, comprising:

a fluid source;

a fluid supply circuit and a fluid return circuit each interconnecting said fluid source and said torque converter unit, said fluid return circuit including a fluid return passage having an annular passage portion formed about said driven shaft; and

a lubrication circuit for said bearing, including an extension annular passage formed about said driven shaft and fluidly connected to said annular passage portion, a flow restriction ring mounted on said driven shaft and fluidly connected to said extension annular passage as a passage portion thereof, said flow restriction ring being situated upstream of said bearing for reducing the flow rate of fluid passed therethrough, a fluid seal mounted on said driven shaft downstream of said bearing for providing with said extension annular passage a closed end, and a lubrication fluid drain passage having one end fluidly connected to said extension annular passage at a location between said flow restriction ring and said bearing and the other end fluidly connected to said fluid source.

4,096,694

CONTROL SYSTEM FOR A FLUID DRIVE

Cyril W. Habiger, and Leon E. Hicks, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 5, 1977, Ser. No. 813,029

Int. Cl.² F15B *15/18, 11/16*

U.S. Cl. 60—459 **8 Claims**

1. A control system for a fluid drive assembly comprising:

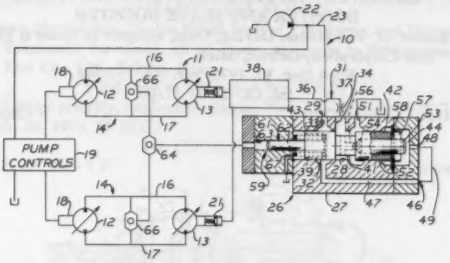
a pump;

a variable displacement two-speed motor having actuator means for controlling the displacement of the motor, said actuator means being movable between a first position at which the displacement of the motor is at a preselected maximum and a second position at which the displacement of the motor is at a preselected minimum;

a fluid circuit connecting the pump to the motor;

a source of fluid at a first preselected pressure level;

valve means connected to the source of fluid and to the actuator means for controlling fluid flow therebetween, said valve means having a valve member movable between a first position at which the source of fluid is blocked from communication with the actuator means and



a second position at which the source of fluid is in communication with the actuator means;

first means for controllably automatically moving the valve member to the first position in response to the fluid pressure in the fluid circuit exceeding a second preselected level;

second means for retaining the valve member in the first position until the fluid pressure in the fluid circuit decreases from the second preselected pressure level to a third preselected pressure level.

4,096,695

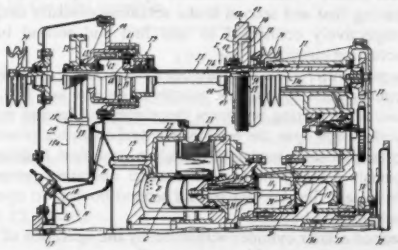
ENGINE DRIVEN HEATING SYSTEM COMPONENTS FOR STIRLING ENGINES

Lowell A. Reams, Plymouth, and Andrew E. Geddes, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 3, 1977, Ser. No. 774,074

Int. Cl.² F02G *1/04*

U.S. Cl. 60—517 **5 Claims**



1. A two power-source drive system for use in a Stirling engine having a longitudinally extending centerline and an engine driven element coincident therewith providing one power source, comprising:

(a) an electrically energized motor providing a second power source,

(b) a first shaft offset but aligned with said centerline, said first shaft being drivingly connected to said driven element,

(c) a second shaft concentrically disposed about said first shaft,

(d) means providing a viscous drive connection between said first and second shafts,

(e) a plurality of combustion circuit components for said engine, each of said components being connected to said second shaft, and

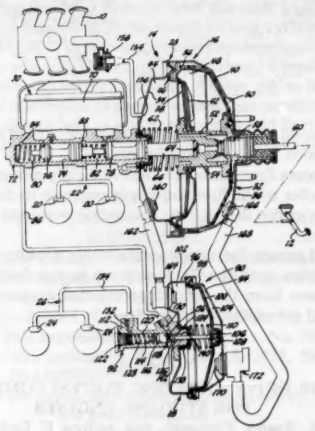
(f) means providing a one-way driven connection between said second shaft and motor whereby drive may be transmitted either from said motor or first shaft to said second shaft in the same rotative direction.

4,096,696

VEHICLE POWER BRAKE SYSTEM WITH MASTER BOOSTER AND SLAVE BOOSTER

Robert M. Van House, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 10, 1976, Ser. No. 751,048
Int. Cl.² B60T *13/00*
U.S. Cl. 60—547 **4 Claims**



1. A brake system in a vehicle having first and second brake actuating circuits for actuating first and second brake sets, said system comprising:

a first differential pressure operated booster having first and second operating pressures;

a first master cylinder actuatable by said first booster and having first and second brake actuating pressure outputs respectively connected to said first and second brake actuating circuits;

a second differential pressure operated booster operatively connected with said first booster to receive said first and second operating pressures therefrom and having means acting only upon the establishment of operating pressures of a predetermined differential in said first booster to permit delivery of said differential operating pressures from said first booster to said second booster to operate said second booster;

a second master cylinder actuatable by the operation of said second booster and having normally open valve means in said second brake actuating circuit fluidly intermediate said first master cylinder second brake actuating pressure output and the second brake set;

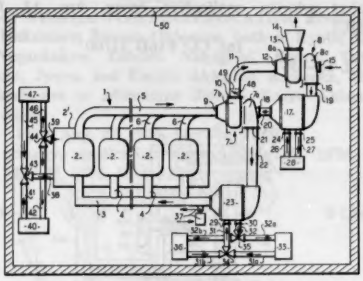
said normally open valve means permitting brake actuating pressure to pass through said second master cylinder from said first master cylinder to the second brake set while open, and arranged to be closed by initial operation of said second booster, said second master cylinder being actuatable by operation of said second booster when said valve means is closed to pressurize the portions of said second brake actuating circuit from said second master cylinder to the second brake set in accordance with operation of said second booster.

4,096,697

METHOD AND MEANS FOR CONDITIONING THE INTAKE AIR OF A SUPERCHARGED, LOW-COMPRESSION RATIO DIESEL ENGINE

Bernard Treuil, Paris, France, assignor to Societe d'Etudes de Machines Thermiques S.E.M.T., Saint Denis, France

Continuation-in-part of Ser. No. 484,212, Jun. 28, 1974, Pat. No. 3,977,195. This application Feb. 24, 1976, Ser. No. 660,978
Claims priority, application France, Feb. 25, 1975, 75 05851
Int. Cl.² F02B *29/04*
U.S. Cl. 60—599 **77 Claims**



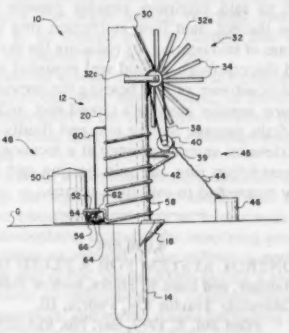
1. A method for at least temporarily heating the pre-compressed intake air of a supercharged, low compression ratio, internal combustion engine at start and low-load operating conditions, said method comprising the step of at least temporarily pre-heating said intake air before it is used to support combustion for burning fuel in the cylinder, wherein the improvement comprises initially cranking the engine from the stopped condition while temporarily delaying any fuel injection into at least one cylinder for at least one part of the starting time period of the engine and at the same time selectively impeding the exhaust gas streaming from said at least one cylinder for retaining a controlled amount of residual working gases in said at least one cylinder.

4,096,698

SOLAR ENERGY CONVERTING DEVICE

Charles S. Martin, 207 Hamilton Ave., Albemarle, N.C. 28001

Filed Jan. 14, 1977, Ser. No. 759,581
Int. Cl.² F03G *7/02*
U.S. Cl. 60—641 **7 Claims**



1. A solar energy converting device comprising: an upright air channeling device having an elongated generally closed internal air channeling area for channeling air from a lower level to an upper elevated level; means provided about a lower level of said air channeling device for permitting air to enter the lower level thereof; preheating means disposed about the lower level of said air channeling device for heating air enter-

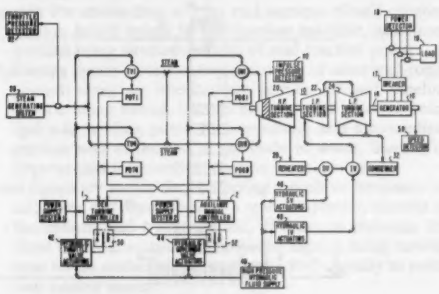
ing the lower level thereof which tends to cause the preheated air to more readily move upwardly within the air channeling device; said air channeling device having a main exposed outer solar energy collecting surface for collecting available solar energy and transferring a portion of any collected solar energy inwardly to the air moving vertically therein so as to provide additional heat to the vertically moving air; windmill means having a plurality of radially extending vanes rotatively mounted about an upper level of said air channeling device and disposed such that a portion thereof lies in the normal air flow path of air moving vertically from the lower level of said air channeling device to an upper level of said air channeling device such that said windmill means is rotatively driven in response to rising air moving within said air channeling device engaging vanes of said windmill means, thereby causing the vanes of said windmill means to be rotatively driven; energy conversion means operatively connected to said windmill means and driven thereby for converting energy of said rotatively driven windmill means to a desired form of useful energy; and means for collecting solar energy and storing at least a portion thereof during periods where solar energy is available for use during desired periods such as nighttime or during periods of limited sunlight for preheating said air entering said air channeling device.

4,096,699

AUXILIARY MANUAL TURBINE CONTROLLER

William E. Zitelli, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 23, 1977, Ser. No. 771,290
Int. Cl.² F01K *13/02*
U.S. Cl. 60—657 **9 Claims**



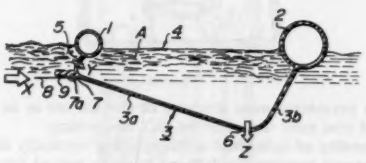
1. A steam turbine control system comprising:
a source of steam;
a steam turbine;
a plurality of steam admission control valves coupled between said steam source and said steam turbine to control the steam flow passing through said steam turbine from said steam source, said steam flow being a function of the position of each of said steam admission control valves;
a rate control means for each steam admission control valve, each of said rate control means being coupled to a corresponding steam admission control valve for controlling the rate of position movement therein;
a position detection means for each steam admission control valve, said each position detection means operative to generate a primary and an auxiliary valve position signal, both representative of the actual position of their corresponding steam admission control valve;
a primary turbine controller governed at times by said primary valve position signals to generate a set of valve position control signals, each valve position control signal corresponding to a steam admission control valve;
an auxiliary turbine controller governed at times by said auxiliary valve position signals to generate a set of auxiliary valve position control signals, each valve position control signal corresponding to a steam admission control valve; and
switching means operative to select one of the primary and auxiliary sets of valve position control signals to govern their respective rate of control means which controls the rate of position movement of each of the steam admission control valves.

4,096,700

OIL BOOM FOR DAMMING AND COLLECTING A FLOATING OIL SLICK

Tateo Muramatsu; Toshio Fukai, both of Yokohama, and Haruo Takahashi, Kawasaki, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1976, Ser. No. 738,977
Claims priority, application Japan, Nov. 12, 1975, 50-152877; Feb. 20, 1976, 51-18251
Int. Cl.² E02B *15/04*
U.S. Cl. 61—1 F **15 Claims**



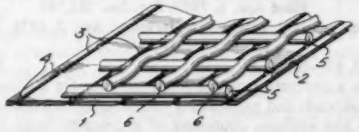
1. An oil boom for damming and collecting a floating oil slick comprising two rows of floats spaced apart from each other and partly submerged in water, one row being disposed upstream of the other row, a flexible base sheet connected across base portions of said two rows of floats and hanging down therefrom below into the water in a curved shape, a plurality of inlet openings arranged near said upper stream side float and extending in its lengthwise direction, an inflow guide plate integral with said flexible base sheet and arranged below said inlet openings, said inflow guide plate projecting upstream in a direction in parallel with the water surface, and a plurality of outlet openings arranged in a rear portion of said flexible base sheet and extending in its lengthwise direction, the total opening area of said outlet openings per unit length of said flexible base sheet in its lengthwise direction being larger than that of the inlet openings.

4,096,701

MATTRESSES FOR SUBAQUEOUS STRUCTURES

Cornelis Den Boer, Abbenbroek, Netherlands, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 2, 1977, Ser. No. 764,863
Claims priority, application United Kingdom, Feb. 10, 1976, 5176/76
Int. Cl.² E02B *3/12*
U.S. Cl. 61—38 **2 Claims**



1. A mattress for civil engineering use, including use in subaqueous structures, comprising two plies of synthetic fabric, one of which is non-woven, the other being woven, said plies being joined by sewn threads along one length of the mattress in parallel lines 10–100 cm apart with at 10–100 cm intervals, 2–8 cm lengths of unsewn threads forming loops for

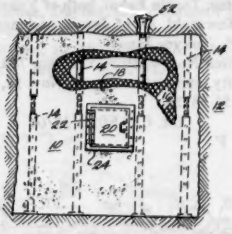
tying on fascines, said mattress being provided with fascines attached by means of said loops, said fascines being formed from tubes of non-woven fabric.

4,096,702

MINE STOPPING DEVICE AND METHOD OF CONSTRUCTING SAME

Willard J. Burton, Box 20, Verdunville, W. Va. 25649

Filed Oct. 17, 1975, Ser. No. 623,457
Int. Cl.[2] E21F *1/14*
U.S. Cl. 61—45 R **5 Claims**



1. A permanent mine stopping device for use in an underground coal mine tunnel or the like, comprising:

a plurality of individual self-supporting vertically disposed support members each being laterally spaced from adjacent members said plurality of support members being positioned so as to extend across the width of the mine tunnel being stopped;

each of said support members having a top and bottom end and adjustment means for vertically adjusting the length of said support member so that the length of each of said support members can be extended until the top and bottom ends respectively come into engagement with the roof and floor of the mine tunnel being stopped so that said support members provide support for the roof of the tunnel;

wire mesh secured to the individual support members and extending over substantially the entire cross-section of the tunnel;

plaster applied to the wire mesh and having its outer periphery in substantially air-tight sealing engagement with the walls, floor and ceiling of the mine tunnel, whereby air is prevented from flowing through the tunnel in which the device is placed, each of said support members being comprised of upper and lower members, said upper and lower members being connected together by said adjustment means so as to be movable toward and away from each other, and wherein each of said upper and lower members are provided along their length with a plurality of apertures so as to permit the wire mesh to be secured to said support members.

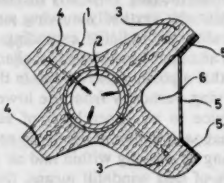
4,096,703

CONCRETE CONSTRUCTIONAL MEMBERS

Friedrich Karl Lüder, P.O. Box 2256, D-2400 Lübeck, Germany

Filed Apr. 1, 1977, Ser. No. 783,744
Claims priority, application Germany, Apr. 3, 1976, 2614438
Int. Cl.[2] E02D *5/12, 5/32*
U.S. Cl. 61—59 **8 Claims**

1. In a concrete constructional member for building walls and bulkheads and particularly moles, quay bulkheads, groins or the like edifices, consisting of a concrete body having a vertically continuous opening in the central area and having pairs of divergent arms of different length on two opposing sides, the end faces of the shorter pair of arms being capable of being brought into contact with the inner faces of the longer pair of arms on an adjoining constructional member, the improvement which consists in that the constructional member is formed as an integral part of concrete extending in height from the foot of an edifice which is to be built, to at least the vicinity of the surface of the water, and the lower end of the constructional member, on the side facing in the direction of construction, having an extension in the form of an apron which



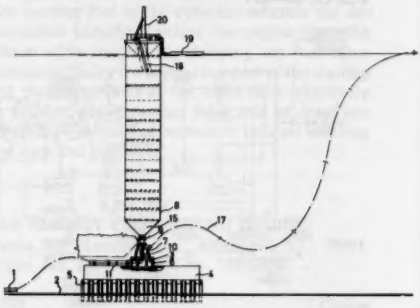
projects beyond the lower end of the constructional member and which masks the space between said longer arms of the cross-section, except for the contact areas for said shorter arms of a succeeding concrete member.

4,096,704

OFFSHORE PRODUCT LOADING TERMINAL

Stewart Marr Adamson, and Alan Edgar John Bliault, both of Portchester, England, assignors to David Brown-Vosper (Offshore) Limited, Portchester, England

Filed Nov. 15, 1976, Ser. No. 742,123
Int. Cl.[2] E02B *17/00;* B63B *27/24*
U.S. Cl. 61—95 **11 Claims**



1. An offshore product-loading terminal comprising in combination:

a support on a sea bed;

a turntable having a lower part fixed to said support and an upper part rotatable relative to said lower part about a vertical axis passing through said turntable;

a buoy including means for mooring a ship;

a universal joint connecting said buoy to said upper part of said turntable, said buoy being rotationally coupled by said joint to said upper part for joint rotation therewith, and said buoy, joint, and turntable constituting a force-transmission path from said means for mooring to said support;

a pipe swivel outside said force path and including a first portion carried by said support and a second portion rotatable about said vertical axis relative to said first portion;

an input line connected to one of said portions and connectable to a source of the product to be loaded;

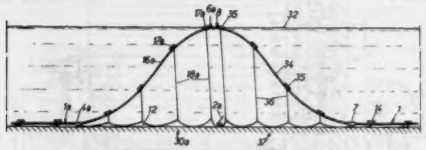
an output line connected to the other of said portions and connectable to a deposit location for the product to be loaded, the line connected to said second portion being flexible.

4,096,705

LAYING OF UNDERWATER PIPELINES

Jacques Edouard Lamy, Fontenay-aux-Roses, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris", Paris, France

Filed Jan. 5, 1977, Ser. No. 757,098
Claims priority, application France, Jan. 27, 1976, 76 02135
Int. Cl.[2] F16L *1/00*; B63B *35/04*
U.S. Cl. 61—111 14 Claims



1. Apparatus for laying a pipeline on the bed of a body of water by the process consisting of successively towing in the body of water first and second pipeline sections each having a front end and a rear end, then joining the front end of the first section to the rear end of the second section, comprising

towing means, including a traction machine, for applying a traction effort at a traction point on a pipeline section being towed to draw the same forward, said traction point being spaced from the front end of said section being towed;

holding means, including a holding machine, for applying a holding effort at a holding point on said pipeline section being towed to maintain the same in tension, said holding point being spaced from the rear end of said section being towed;

means for connecting a front end portion of said pipeline section being towed to the traction machine, said front portion being situated in front of said traction point;

ballasting means incorporating a plurality of short trail-ropes spaced along an intermediate portion of said pipeline section being towed, located between said traction point and said holding point, for supporting said intermediate portion near to the bed of the body of water, thereby to prevent said intermediate portion from deviating;

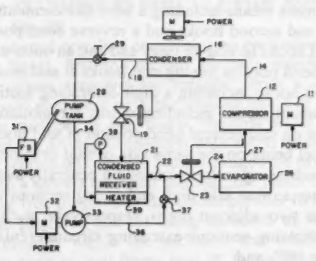
and buoyancy means for conferring a positive buoyancy to said front end portion and to a rear end portion situated to the rear of said holding point, in order to maintain the front and rear ends of said pipeline section being towed, near to the surface of the body of water, thereby to make said joining easier.

4,096,706

FREE CONDENSING LIQUID RETRO-PUMPING REFRIGERATION SYSTEM AND METHOD

Sterling Beckwith, 1824 Doris Dr., Menlo Park, Calif. 94025

Filed Mar. 9, 1977, Ser. No. 775,788
Int. Cl.[2] F25B *1/00, 41/00, 39/04*
U.S. Cl. 62—115 10 Claims



8. The method of providing a condensed fluid at a high pressure to an expansion valve coupled to an evaporator, comprising the steps of

compressing the fluid in gaseous phase from the evaporator to a pressure dependent upon ambient temperature,

condensing the fluid at ambient temperature to a liquid phase,

collecting the liquid phase fluid,

sensing a predetermined level of the collected liquid phase fluid,

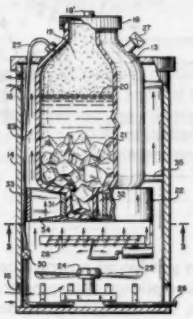
pumping the liquid phase fluid to a high pressure when the predetermined level is reached, and delivering the high pressure liquid phase fluid to the expansion valve.

4,096,707

PORTABLE REFRIGERATION MACHINE

William P. Taylor, 4541 Lyme Bay, Oxnard, Calif. 93030

Filed Oct. 18, 1976, Ser. No. 733,360
Int. Cl.[2] F25D *3/12*
U.S. Cl. 62—167 2 Claims



1. A portable refrigeration machine including, in combination:

(a) a pressure vessel for receiving carbon dioxide in liquid and/or solid phases;

(b) a heat exchanger secured to the lower external portion of said vessel;

(c) an outer housing surrounding said vessel in spaced relationship thereto leave an annulus between the exterior wall surface of the vessel and the interior wall surface of said housing above said heat exchanger, said housing having an upper air outlet opening communicating with said annulus and a lower air inlet opening disposed beneath said heat exchanger;

(d) a gas operated fan disposed to cause air flow across said heat exchanger;

(e) conduit means connecting the upper interior of said vessel to said gas operated fan to rotate said fan by expanding carbon dioxide gas from said vessel and thereby causing air to enter said inlet opening and pass through said heat exchanger and annulus out said outlet opening, said heat exchanger absorbing heat in said air into said vessel whereby said air passing out said outlet opening is cool;

(f) temperature responsive control means including a baffle plate structure between said fan and said heat exchanger;

(g) thermal means connected to said baffle plate structure for increasing or decreasing the air flow passage therethrough from the fan to the annulus in response to increasing or decreasing temperatures respectively falling outside given upper and lower temperature limits whereby the temperature of the circulating air is maintained within a desired range; and

(h) a cycling valve interposed in said conduit between said vessel and fan for periodically interrupting the flow of gas to said fan so that said fan is operated intermittently to

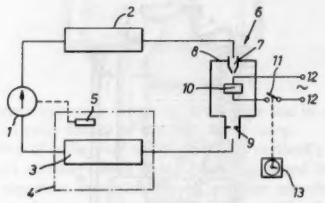
thereby provide inactive time intervals during which the air in a refrigerated compartment in which said machine is placed can redistribute itself to thereby provide a more uniform temperature throughout the volume of the refrigeration compartment to be cooled.

4,096,708

COMPRESSOR REFRIGERATION PLANT

Bent Karll, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 744,631, Nov. 24, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 845,119
Claims priority, application Germany, Jun. 22, 1976, 2553562
Int. Cl.[2] F25D *21/06*
U.S. Cl. 62—275 **4 Claims**



1. A refrigeration unit having a normal operating cycle and a defrosting cycle, comprising, a compressor, a condenser unit, an evaporator unit, said units being connected in series by conduit means, a chamber in said conduit means between said condenser unit and said evaporator unit, a heating resistor in said chamber, circuit means for supplying a current to said resistor, to produce the defrost cycle by heating the refrigerant to a gaseous state to add heat thereto and slow the flow thereof, throttling means downstream of said chamber formed by an axially short throttling element which only slightly impedes the flow of refrigerant in a liquid state but further slows the flow of a refrigerant in a gaseous state, the portion of said conduit means between said chamber unit and said evaporator unit being a single conduit which carries refrigerant in a liquid state during the normal refrigerating cycle and a reduced quantity of heated refrigerant in the gaseous state during the defrosting cycle.

4,096,709

RUPTURE-PREVENTING AIR-RELEASING WATER-FREEZING RESERVOIR

Gerhard Barthel, 14657 Juliana, East Detroit, Mich. 48021

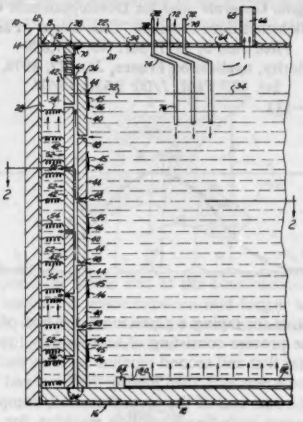
Filed Apr. 14, 1977, Ser. No. 787,326
Int. Cl.[2] F25D *3/10*
U.S. Cl. 62—307 **10 Claims**

1. A wall-rupture-preventing air-releasing water-freezing reservoir, comprising

a water-tight tank having top, bottom and side wall,

an expansible substantially continuous heat-insulating barrier rising from said bottom wall of said tank above the water level thereof in close proximity but in spaced relationship to said side wall and defining and separating from one another an outer unfrozen-water chamber and a larger inner water-freezing chamber,

said barrier and at least one of said tank walls having expended-air outlet passageways therethrough,



and means for discharging into said inner chamber of said tank below the water level thereof outside atmospheric winter air at below-water-freezing temperatures.

4,096,710

FOOT JEWELRY

Betty Jeanne Sloan, 33915 Calle Acordarse, San Juan Capistrano, Calif. 92675

Continuation-in-part of Ser. No. 676,711, Apr. 14, 1976, abandoned. This application Jan. 14, 1977, Ser. No. 759,486
Int. Cl.[2] A44C *25/00*
U.S. Cl. 63—2 **10 Claims**

1. An ornamental ring removably attachable to at least two adjacent digits comprising:

an ornament;

attachment means for attaching the ornament to the two adjacent digits;

said attachment means including a wire-like element including first and second hooks and a reverse bend portion;

each of said hooks having an inner end and an outer end, said reverse bend portion joining said hooks at said inner ends;

each of said hooks including a digit embracing section;

said attachment means including means for mounting said ornament on said reverse bend portion of said hooks with said hooks being on the same side of said ornament;

said digit embracing sections extending generally away from each other so that said digit embracing sections can embrace the two adjacent digits, respectively, each of said digit embracing sections extending circumferentially for less than 360°; and

said reverse bend portion offsetting said inner ends of said hooks and at least substantial portions of said digit em-

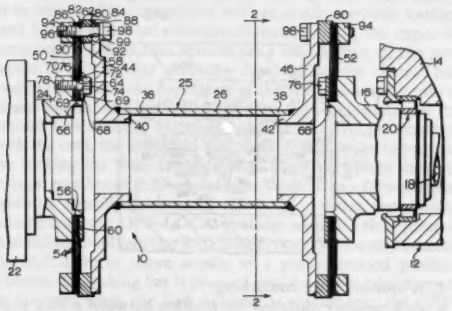
bracing sections in a direction generally axially of the hooks.

4,096,711

DUAL FLEX PLATE DRIVE

George A. Carlson, and William O. Jankovsky, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 13, 1976, Ser. No. 750,091
Int. Cl.[2] F16D *3/78*
U.S. Cl. 64—13 4 Claims



1. In a vehicle drive assembly, in combination,
(a) a power source having an output,
(b) a transmission axially spaced from said power source and having an input,
(c) a coupling axially aligned with and positioned between said power source and said transmission,
(d) said coupling having means connecting said coupling to said power source and to said transmission,
(e) said means comprising two flexible plates,
(f) each said flexible plate being secured along its outer peripheral portion to flanges on said coupling,
(g) one of said flexible plates being secured along its inner peripheral portion to the output of the power source,
(h) the other of said flexible plates being secured along its inner peripheral portion to the input of the transmission,
(i) a spacer ring secured between each flexible plate and said coupling, and
(j) oppositely extending pilots formed on each said ring with one pilot engaging the coupling and the other pilot engaging one of said flexible plates, said pilots positioning said flexible plates and said coupling relative to each other.

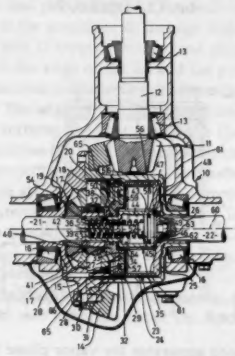
4,096,712

CONTROL COUPLINGS AND GEARING COMBINED THEREWITH

Oswald Webb, Coventry, England, assignor to GKN Transmissions Limited, Birmingham, England

Filed Feb. 23, 1976, Ser. No. 660,075
Claims priority, application United Kingdom, Feb. 25, 1975, 7757/75
Int. Cl.[2] F16D *3/80;* F16H *1/44;* F16D *19/00, 31/00*
U.S. Cl. 64—26 12 Claims

1. A control coupling comprising an enclosure containing a viscous liquid; first and second mutually interleaved sets of annular plates arranged for rotation about a common axis within said enclosure with the viscous liquid in contact with adjacent surfaces of said plates, the first set of plates being arranged for driving connection with a first rotatable member and the second set of plates being arranged for driving connection with a second rotatable member; the plates of at least one set being free to move in directions parallel to said common axis; the plates of one set being mounted on a hollow hub which projects within the enclosure and which has a bore which is open to, and forms part of, the enclosure volume; a piston slidable in the bore to vary the volume of the enclosure; and resiliently yieldable means located in the bore urging the piston towards a limit position in which the volume of the bore in communication with the remainder of the enclosure is at a minimum; the strength of the resiliently yieldable means being chosen according to a desired torque transmitting characteristic for the coupling, and the quantity of viscous liquid within the enclosure being such that at an ambient temperature of 25° C and with the coupling at rest the viscous liquid occupies a volume in the range 85% to 100% of the volume of the enclosure when said piston is in said limit position.

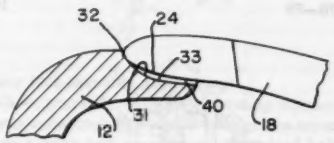


4,096,713

KNITTING NEEDLE

Antone Lopes, Jr., and Richard Wilton Shepard, both of Torrington, Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Aug. 8, 1977, Ser. No. 822,446
Int. Cl.[2] D04B *35/04*
U.S. Cl. 66—121 6 Claims



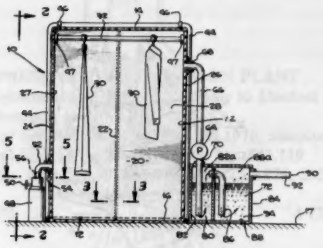
1. A latch needle comprising: a blade; a hook on one end of the blade, said hook having a groove formed on its outer perimeter, the groove having a bottom surface extending from a point on the outer perimeter of the hook longitudinally spaced from the free end of the hook up to the free end, and a latch having one end pivotally connected to the blade, said latch having its free end provided with an inner surface formed to seat in the groove of the hook, the shape of the groove and the shape of the latch being such that initially only the end portion of the inner surface of the latch contacts the bottom surface of the groove in the latch closed position near said point on the outer perimeter of the hook with a remaining part of the inner surface of the latch located in the groove being spaced from the bottom surface of the groove, that portion of the inner surface of the latch coming into contact with the groove bottom surface gradually increasing in area as the groove bottom surface and the inner surface of the latch wear together during needle operation.

4,096,714

SELF-CONTAINED GARMENT TREATING APPARATUS

Robert P. Nirenberg, 1314 17th St., #32, Santa Monica, Calif. 90404

Filed Dec. 3, 1976, Ser. No. 747,232
Int. Cl.[2] D06B 5/24
U.S. Cl. 68—5 C 8 Claims



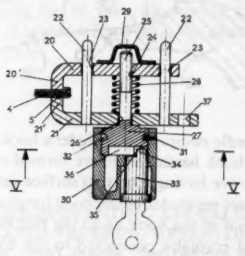
1. Self-contained apparatus for vapor phase treating of garments with durable press treating agents, comprising a pressurized agent supply, a pressurizable treating chamber for enclosing garments to be agent treated, means to vaporize said treating agent, means to feed the vaporized treating agent into said treating chamber for pressurizing said treating chamber and for treating the garments with said treating agent, pump means conmunicating with said treating chamber for withdrawing unused treating agent from said treating chamber and for cyclically depressurizing the chamber interior in time relation to said agent supply repressurizing said chamber with treating agent to relatively pressure-impregnate the garments with said treating agent in vapor phase, and means in flow communication with said pump means for recovery of unused treating agent.

4,096,715

ANTI-THEFT DEVICE FOR A MOTORCYCLE HELMET

Paul Lipschutz, Croissy, France, assignor to Neiman S.A., Courbevoie, France

Filed Mar. 4, 1977, Ser. No. 774,300
Claims priority, application France, Mar. 31, 1976, 76 09261
Int. Cl.[2] E05B 69/00
U.S. Cl. 70—59 10 Claims



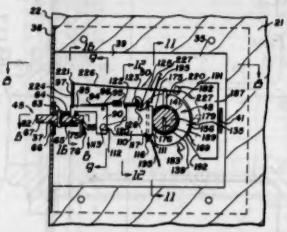
1. An anti-theft device for a motorcycle helmet, said helmet having a continuous rib on the periphery of the edge of its opening, wherein there is provided means for gripping said edge of the opening of the helmet behind said rib, and a lock device for locking said gripping means in the gripping position, wherein said gripping means comprises two branches mounted to pivot about a pin remote from the ends of said branches, two confronting ends of said branches having cooperative nose portions forming a tongs, and a bolt member actuated by a lock device integral with one of said branches, said bolt member being capable of occupying a first position in which it does not prevent the opening of said tongs and a second position in which it prevents the opening of said tongs, said lock device and the bolt member being connected to each other to move in translation.

4,096,716

LOCK-LATCH SET

Paul S. Cormier, #2-520 Victoria St., New Westminster, B.C., Canada

Filed Aug. 23, 1976, Ser. No. 717,261
Int. Cl.[2] E05B 65/06
U.S. Cl. 70—139 51 Claims



1. A lock-latch set comprising:

a latch member mounted for rotation between a lock position and an unlock position,

stop means on the latch member,

a plurality of locking trains of different lengths, mounted for movement in opposite directions between a locking position and a release position, said trains each having a pivotally mounted outer end portion positioned to engage said stop means and an opposite slidably mounted inner end portion, said outer end portion when the trains are moved to a locking position engaging the stop means to retain the latch member in the lock position and when the trains are oppositely moved to the release position disengaging the stop means to allow the latch member to rotate to the unlock position, and

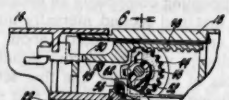
a shaft assembly mounted adjacent said inner end portions of the locking trains, said assembly having means for receiving a key having a number of teeth of predetermined lengths corresponding to the different lengths of the locking trains with said teeth positioned to engage the train inner end portions, said assembly allowing the key to be turned to permit the key teeth to engage said respective inner end portions to move the locking trains to the release position to allow the latch member to rotate.

4,096,717

TRANSMISSION SHIFT CONTROL

William D. Cymbal, Freeland, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1977, Ser. No. 792,313
Int. Cl.[2] B60R 25/02, 25/06; E05B 65/12
U.S. Cl. 70—248 3 Claims



1. For use with a synchromesh steering column including a jacket having a rotatable shift bowl and a nonrotatable housing

mounted at the upper end thereof, a shift tube concentrically mounted within the jacket and shift bowl and slidably mounted at its upper end within a central hub bushing secured to the housing, a shift lever pivotally mounted on the shift bowl with its inner end operatively connected to the shift tube for axially moving the latter in either direction within the central hub bushing, the shift bowl being rotatable by manual movement of the shift lever through a predetermined angle in one direction to a common circumferential location for REVERSE position and at least one forward gear position, a gate formed on an inner surface of the shift bowl, a lock cylinder mounted in a wall of the housing and having a rotatable gear sector mounted at its inner end in engagement with an axially movable toothed rack having an off-set extension formed thereon, the improvement comprising a cam formed on a side surface of the gear sector, a locking bar pivotally mounted on the central hub bushing adjacent the upper end of the shift tube, and resilient means operatively connected between the locking bar and the central hub bushing for urging the locking bar into contact with the cam, the shift tube being axially positioned to prevent the locking bar from being pivoted inwardly by the cam via manual rotation of the lock cylinder while in any forward gear position, thereby preventing the lock cylinder from being rotated into the OFF-LOCK position until the shift lever is manually moved into the REVERSE position, thereby causing the shift tube to move axially to a predetermined position wherein the locking bar is pivoted past the upper edge thereof by the cam when the lock cylinder is rotated into the OFF-LOCK position, thus permitting the key to be removed from the lock cylinder while positioning the toothed rack such that the off-set extension of the toothed rack cooperates with the gate to prevent the shift bowl from being rotated by the shift lever.

4,096,718

TAMPER-PROOF LOCKING DEVICE

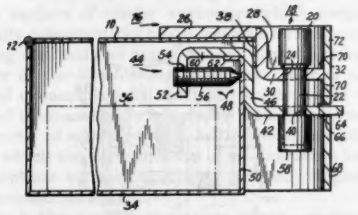
Lionel S. Michelman, Pomona; Samuel M. Michelman; David L. Michelman, both of Queens, and Milton Michelman, Long Beach, all of N.Y., assignors to Michelman Iron Works Corp., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 693,293, Jun. 7, 1976, Pat. No. 4,031,722. This application Mar. 31, 1977, Ser. No. 783,274

The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.

Int. Cl.[2] E05B *65/52, 67/38;* E05C *19/18*

U.S. Cl. 70—63 **19 Claims**



1. A tamper-proof locking device mountable on a lidded container or the like comprising a first member and a second member, said first member being divided into a first, a second, and a third section in series at substantially right angles to each other, the third one of said sections being provided with at least one opening, said second member comprising a strip having a generally U-shaped section and projecting section, said U-shaped section having a first leg and a second leg, said projecting section extending laterally outwards from and substantially perpendicular to the lower end of the first leg of said U-shaped section and being provided with at least one opening, the second leg of said U-shaped section being provided with a threaded bore, and screw means extending through the bore in said second leg, so that the locking device is mountable on a lidded container by placing the U-shaped section of the second member on a wall of a container with said legs straddling said wall and with said second leg and said screw means within the container, turning said screw means until the tip of said screw means contacts and presses against the wall of the container, closing the lid of the container so that the edge of the lid rests on the base of said U-shaped section, and mounting said first member on both the edge of the lid and the projecting section of the second member with the first section of the first member extending over the edge of the lid, the second section of the first member overlying the first leg of the U-shaped section, and the third section of the first member extending substantially over the projecting section of the second member, so that said members are attachable to each other by lock means having a shackle extending through the opening in said third one of said sections of said first member and the opening in said projecting section of said second member, said first member having another section functionally unitary therewith to cooperate with said projecting section to inhibit relative angular movement of the two members about the shackle.

4,096,719

ARRANGEMENT IN DOOR-LOCKS

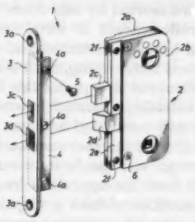
Erik Rudolf Tranberg, Eskilstuna, Sweden, assignor to GKN-Stenman AB, Eskilstuna, Sweden

Filed Feb. 8, 1977, Ser. No. 766,821

Claims priority, application Sweden, Feb. 10, 1976, 7601429; Jun. 24, 1976, 7607329

Int. Cl.[2] E05B *9/08*

U.S. Cl. 70—450 **6 Claims**



1. A door lock assembly, comprising:

a. a hollow, generally rectangular housing member formed by two connected halves and adapted to accommodate therein a latch bolt mechanism and a dead bolt mechanism, including a latch bolt and a dead bolt extending outwardly from one side of the housing member,

b. face plate means, comprising:

1. an elongated face plate having apertures therein for receiving the latch bolt and dead bolt, the vertical height of said face plate being greater than the horizontal depth of the housing member,

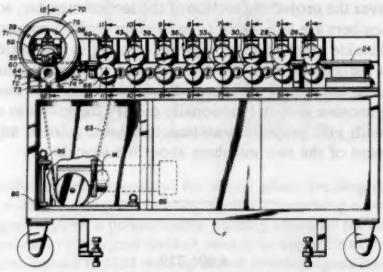
2. an elongated U-shaped member comprising a bridging portion and a pair of opposite leg portions extending outwardly from the bridging portion, said bridging portion being rigidly joined to the back side of said face plate and said leg portions extending into mating engagement with said one side of the housing member over a substantial portion of the length of said face plate, and

c. means removably connecting said leg portions to both halves of the housing member, whereby said U-shaped member stiffens and reinforces said housing member and forms a unitary assembly therewith which presents a high degree of resistance to forcing.

4,096,720
APPARATUS FOR MAKING CORRUGATED FLEXIBLE METAL TUBING

Leroy E. Anderson; Michael P. Schmidt, and William W. Weaver, all of Detroit Lakes, Minn., assignors to Manufacturers Systems, Inc., Detroit Lakes, Minn.

Division of Ser. No. 739,571, Nov. 8, 1976, which is a division of Ser. No. 656,389, Feb. 9, 1976. This application Dec. 9, 1977, Ser. No. 859,258
Int. Cl.[2] B21C *37/12*
U.S. Cl. 72—50 9 Claims



1. Corrugated flexible cylindrical duct-forming mechanism for producing such duct from a flat narrow elongated strip of formable metal of small guage comprising:

(a) a frame;

(b) rotatably mounted powered roller means carried by said frame and constructed and arranged to die-form longitudinally extending corrugations in such a metal strip and to form oppositely extending side edge portions thereon as it passes therebetween;

(c) guide means carried by said frame and positioned adjacent said roller means in metal strip-receiving relation thereto and being constructed and arranged to preform for subsequent interlocking, such side edges of such strip into seam elements as it passes therethrough;

(d) a pair of rotatably mounted powered rollers carried by said frame and positioned adjacent said guide means in position to receive therebetween such a metal strip after it passes through said guide means and constructed and arranged to form the oppositely longitudinally extending side edge portions of such a strip into inboard and outboard seam elements extending generally at right angles to the general plane of the strip and in opposite directions;

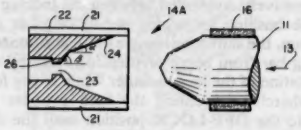
(e) a helically extending warping ring carried by said frame immediately adjacent said seam element-forming rollers, said ring having a generally circular helically extending inner warping surface, the axis of which extends substantially parallel to the axis of said seam element-forming rollers, said warping surface having a leading portion and a trailing portion, said leading portion of said ring warping surface being located ahead of said seam element-forming rollers in position to engage and extend into the corrugation next to the inboard seam element of such a strip and positively direct the same within said ring along said helical warping surface to the said trailing portion of said inner warping surface, said trailing portion of said inner warping surface terminating adjacent to and laterally outwardly of the outboard seam element of said strip which has been so guided by said inner warping surface into the outboard seam element of the strip in interengaging relation and thereby complete a convolution of the strip, and

(f) a pair of rotatably mounted lock-seam-forming rollers carried by said frame coaxially with said seam element-forming rollers and outboardly thereof, said lock-seam-forming rollers having lock-seam-forming elements thereon positioned to engage such interengaged seam elements and constructed and arranged to compress and deform the same into a lock-seam constituting a common leg of a corrugation for the contiguous convolutions of the strip, at least one of said lock-seam-forming rollers being power driven.

4,096,721
HYDROSTATIC EXTRUSION METHODS AND APPARATUS

Nazeer Ahmed, Princeton, N.J., and Ivan Gerald Histand, Cornwells Heights, Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,734
Int. Cl.[2] B21C *23/32*
U.S. Cl. 72—60 8 Claims



1. A method of forming an elongated product from an elongated workpiece, which elongated workpiece is coated with a hydrostatic medium, the method comprising the steps of:

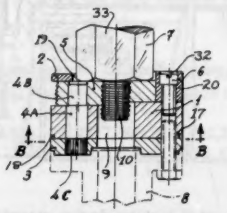
(a) applying frictional drag forces to the hydrostatic medium in the direction of a die so as to advance the elongated workpiece longitudinally, first toward an aperture extending longitudinally through the die, and then through the die aperture; and

(b) removing substantially all of the hydrostatic medium from each successive longitudinal element of the elongated workpiece, substantially as said longitudinal element reaches the die, such that the elongated workpiece passes through the die aperture in substantially uncoated condition.

4,096,722
ROLL-TYPE THREAD CUTTING DIE

Jose Estaban Torralba, Miguel Servet, 216, Zaragoza, Spain

Filed Jul. 26, 1976, Ser. No. 708,563
Claims priority, application Spain, Jul. 31, 1975, 214.356
Int. Cl.[2] B21H *3/04*
U.S. Cl. 72—104 5 Claims



1. A roll-type thread cutting die comprising:

at least three selectively rotatable members, each said selectively rotatable member having an end portion extending from one end of and being eccentric with respect to the axis of rotation of its associated selectively rotatable member; and each said rotatable member having a supported portion that is spaced away from said end portion;

a plurality of rollers, one said roller for each said selectively rotatable member, each said roller being rotatably mounted on said end portion of a different one of said selectively rotatable members, each said roller having an external periphery which is threaded, the threads of each

said roller extending radially outward from its associated selectively rotatable member;

support means for supporting each of said selectively rotatable members at said supported portions thereof and for leaving said end portions unsupported and unengaged by said support means; said support means positioning each of said selectively rotatable members such that the axis of rotation of each said selectively rotatable member lies along a different axis spaced from and parallel to a central axis; and

said support means including means for retaining each of said at least three selectively rotatable members at preselected angular orientations whereby said threads of said plurality of rollers may be adjusted to extend a preselected distance towards said central axis such that said rollers alone cooperate to position a shaft to be threaded along said central axis as said rollers thread said shaft;

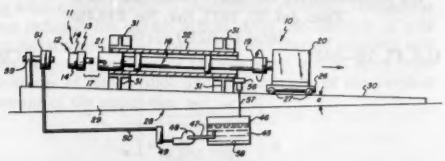
a cover piece positioned above said rotatable member end portions and positioned to prevent said rollers from leaving said rotatable member end portions; said cover piece having a central opening therethrough of a diameter greater than the diameter of a circle defined by the axes of rotation of said selectively rotatable members, whereby a large head on a narrower shank to be threaded may be received in said central opening; said cover being attached to said support means.

4,096,723

TOOL ASSEMBLY FOR FORMING INTERNAL GROOVES IN TUBES

Robin B. Rhodes, Ogdensburg, and Paul Vobecky, Lafayette, both of N.J., assignors to Isothermics, Inc., Augusta, N.J.

Filed Feb. 17, 1977, Ser. No. 769,795
Int. Cl.[2] B21H *3/08*
U.S. Cl. 72—123 **16 Claims**



1. A tool assembly for forming internal grooves on the interior surfaces of tubular workpieces which comprises an essentially cylindrical tool holder, having a forming end and an actuating end, said tool holder housing at said forming end a plurality of disc-like forming wheels, said wheels rotatably mounted circumferentially about said holder within recesses provided therein whereby said wheels partially protrude from the permiter of said tool holder, and wherein the central axes of said wheels and the central axis of said holder are longitudinally coplanar but are respectively uniformly disposed at a predetermined skew angle,

a tool holder support comprising rotating motive means detachably connected to said tool holder at said actuating end, said rotating motive means comprising a rotational actuator rollably mounted for the axial movement of said tool holder longitudinally through a tubular workpiece in contact with the interior surface thereof, and

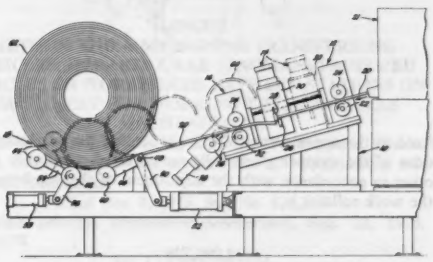
a longitudinally extended base structure, said base structure defining means at one end thereof for the support and securement of said tubular workpiece in axial alignment with said tool holder, said base defining along the remainder of the longitudinal dimensions thereof a travelway for said tool support, said travelway comprising paired track members facilitating the rollable movement of said tool support thereon, said base further disposed at angle with respect to the horizontal whereby said workpiece securement means is apically located with respect to said track members.

4,096,724

METHOD OF COILING A FLAT STRIP

Larry J. Eshelman, Pendleton, and James R. Bish, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 27, 1977, Ser. No. 801,069
Int. Cl.[2] B21C *47/08;* **B21D** *5/14*
U.S. Cl. 72—132 **6 Claims**



1. A method of coiling a flat strip, said method comprising the following steps:

a. advancing the strip longitudinally at substantially constant speed through first and second longitudinally spaced sets of pinch driving rollers having parallel axes;

b. deflecting the end portion of the strip upwardly at the exit from said second set of pinch driving rollers, and continuing to advance said strip to form by bending beyond the elastic limit with substantially circumferential movement of the end of the strip a partial loop capable of clearing an upper one of the second set of pinch driving rollers;

c. discontinuing the deflection of said strip while continuing the longitudinal advancement thereof to advance said partial loop and strip to a coil drive roller and a guide roller having axes substantially parallel to said first axes and initially located to engage an outboard circumferential surface of the partial coil substantially simultaneously to impart circumferential motion thereto in a windup direction and thereafter to move so as to maintain engagement with the periphery of the coil formed by continued winding action;

d. continuing the coiling of the trailing end of the strip by continued advancement thereof by the coil drive roller; and

e. ejecting the finished coil.

4,096,725

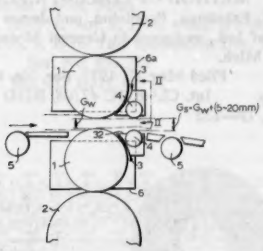
STRIPPER GUIDES FOR ROLLING MILL

Yasunao Kano, Kashima, Japan, assignor to Sumitomo Metal Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 692,022, Jun. 1, 1976, abandoned. This application Nov. 1, 1977, Ser. No. 847,618
Int. Cl.[2] B21B *39/00*
U.S. Cl. 72—250 **3 Claims**

1. In combination a rolling mill for rolling hot slab into plate or strip and having opposed horizontal upper and lower work rolls and work roll chocks in which said work rolls are mounted, stripper guides being disposed adjacent to the work rolls on the exit side of said rolls and each having a single stripper guide roll rotatably mounted therein, the respective stripper guide rolls being disposed above and below the pass line between the opposed work rolls and spaced from each other a distance equal to the work roll gap plus 5 to 20 mm for bending the turned up or turned down end of a work being rolled back more in line with the length of the plate or strip, a portion of the periphery of each stripper guide roll projecting

slightly from the guide surface of the respective stripper guide, each stripper guide roll being the same length as the corresponding work roll, the lower stripper guide being fixed to the lower work roll chocks and the upper stripper guide being



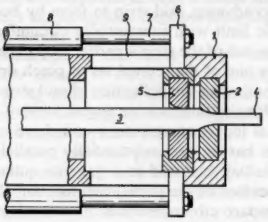
fixed to the upper work roll chocks so that the vertical positions of the stripper guide rolls are adjusted relative to each other in accordance with the adjustment of the gap between the work rolls.

4,096,726

METHOD AND APPARATUS FOR DRAWING TUBES

Otto Uhlmann, Burgdorf, and Norbert Stephan, Hanover, both of Germany, assignors to Marshall Richards Barcro Limited, Crook, England

Filed Feb. 11, 1977, Ser. No. 767,795
Int. Cl.[2] B21C *1/34*
U.S. Cl. 72—291 **6 Claims**



1. In a tube drawing method having at least one drawing step at a drawing stage with a drawing die, a tube guide upstream of the die for receiving and guiding the tube coaxially to the die and a downstream rotatable draw block for drawing the tube through the die, comprising the steps of axially threading the tube through the guide and die with the tube guide a first distance immediately upstream of the die to reduce the required length of tube for threading the tube through the guide and die, and drawing the tube through the guide and die with the draw block with the coaxial tube guide upstream of the die a second distance substantially greater than said first distance providing for accurately guiding the tube coaxially to the die.

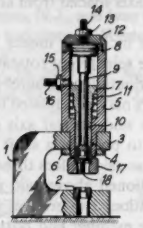
4,096,727

PUNCHING, STAMPING AND RIVETTING APPARATUS

Daniel Pierre Gargaillo, 71, rue Alexandre Boutin, Villeurbanne (Rhone), France

Filed Apr. 29, 1976, Ser. No. 681,755
Int. Cl.[2] B21D *28/26*
U.S. Cl. 72—312 **8 Claims**

1. A hydraulic punch press comprising a base adapted to receive a workpiece, a cylinder axially disposed opposite to said base, first and second pistons slidably mounted within said cylinder and defining therewithin a first chamber formed between the upper surface of said first piston and one end of said cylinder and a second chamber formed between the first and second pistons, said pistons having coaxial rods extending outwardly of the other end of said cylinder in opposition to said base, the rod of the first piston extending axially through the rod of said second piston and being adapted to carry at its free end a tool, the rod of said second piston being tubular and being adapted to carry at its end holding means for the workpiece, conduit means leading to each of said first and second



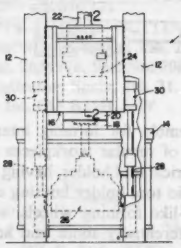
chambers, and means for alternately delivering simultaneously to said first and second chambers hydraulic fluid of high pressure and lower pressure respectively to thereby sequentially reciprocate the rods of both said pistons outwardly in a work phase in which said workpiece holding means engages the workpiece prior to the tool and said rod of said first piston inwardly in a retraction phase while maintaining the rod of said second piston in holding engagement with said workpiece.

4,096,728

ADJUSTING DEVICE FOR SLIDE DRIVEN LIFT OUT ACTUATORS

Donald Leroy Glecker; John F. Roth, both of Salem, Ohio, and Peter N. Bosch, Kentwood, Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Jul. 27, 1977, Ser. No. 819,489
Int. Cl.[2] B21D *45/00*
U.S. Cl. 72—345 **15 Claims**



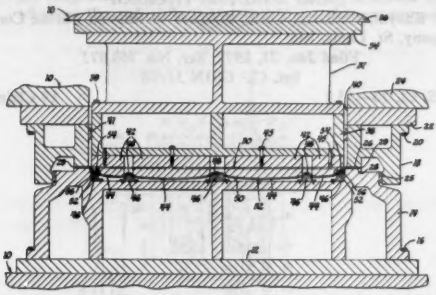
1. In a press having a frame, slide means mounted on said frame for reciprocation toward and away from a bed on said frame to form a workpiece between tooling means on said bed and slide means, drive means for reciprocating said slide means, shut height adjusting means connecting said drive means to said slide means for adjusting the shut height of said slide means relative to said bed, workpiece ejecting means in one of said bed and slide means to eject a workpiece formed between said tooling means, and actuator means interconnecting the other of said bed and slide means with said ejecting means and having a given positional relationship with respect to said ejecting means to actuate said ejecting means in response to reciprocating of said slide means, the improvement comprising: actuator adjusting means for said actuator means, and means to drive said actuator adjusting means and said shut height adjusting means to change said shut height and to maintain said given positional relationship between said actuator means and said ejecting means.

4,096,729

SHEET METAL DRAW DIE APPARATUS

William W. Dupler, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 31, 1977, Ser. No. 801,775
Int. Cl.[2] B21D *22/02*
U.S. Cl. 72—350 4 Claims



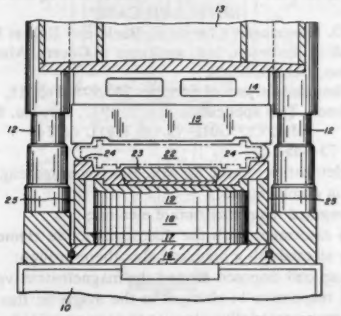
1. A sheet metal draw die apparatus for use with a die press for drawing a planar metal sheet to a predetermined nonplanar drawn article in a single operation, said die apparatus comprising an upper die secured to a vertically movable portion of the die press and including a first plurality of modules laterally spaced in a first predetermined pattern to provide a first plurality of cavities therebetween and having downwardly facing work contact surfaces formed thereon, and a lower die secured to a stationary base portion of the die press and including a second plurality of modules laterally spaced in a second predetermined pattern to provide a second plurality of cavities therebetween and having upwardly facing work contact surfaces formed thereon directly opposite the first plurality of cavities, the juxtaposition of said upwardly and downwardly facing work contact surfaces constituting a distinct, continuous surface defining the drawn article, with the surfaces of said planar metal sheet on the respective sides thereof adjacent said first and second pluralities of cavities being spaced apart from the bottoms of the cavities upon completion of the vertical movement of the upper die.

4,096,730

FORGING PRESS AND METHOD

Wayne A. Martin, Wilkins Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 1, 1976, Ser. No. 701,934
Int. Cl.[2] B21D *22/00*
U.S. Cl. 72—352 4 Claims



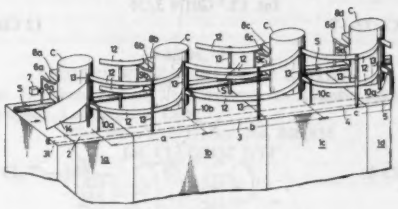
1. In a forging press which includes cooperating sets of top and bottom dies, and an indexing table supporting said set of bottom dies for rotation on a vertical axis, said set of top dies being rectangular in plan and supported for vertical movement, said set of bottom dies being circular in plan, whereby indexing said set of bottom dies through a pattern of arcs moves a workpiece supported thereon successively to positions in which it can be forged throughout its area between said dies, the improvement in which the diameter of said set of bottom dies in larger than the diameter of said indexing table and has edge portions which overhang the table, and comprising a pair of removable diametrically opposed posts outside said table under said set of top dies providing support for said edge portions in the regions which absorb force applied through said set of top dies during a forging operation.

4,096,731

METHOD AND A MEANS FOR TRANSFERRING ARTICLES, IN PARTICULAR SEMIMANUFACTURED ARTICLES OR WORKPIECES, BETWEEN STATIONS ON MACHINERY FOR WORKING THESE ARTICLES MECHANICALLY

Werner Uehlinger, Arlesheim, and Pius Wendelspiess, Binningen, both of Switzerland, assignors to KM-Engineering AG, Basel, Switzerland

Filed Dec. 8, 1975, Ser. No. 638,360
Claims priority, application Switzerland, Sep. 22, 1975, 12256/75
Int. Cl.[2] B21D *43/18*
U.S. Cl. 72—405 31 Claims



1. A method of transferring articles between successive work stations at which working operations are effected, said method comprising the steps of:

a. positioning an article at a first work station,

b. providing at each work station a jet of fluid material including a liquid medium,

c. directing said jet of fluid material by an amount effective in one direction at the article located in the first work station to propel the article toward a successive work station,

d. guiding the article along a defined path to the successive work station after the article has been propelled by said jet, and

e. positioning said article in the successive work station to prepare for a work operation,

f. the defined path is curved between the successive work stations and has an inner and outer side the article is guided by bearing against the outer side,

g. the positioning of said article in the successive work station includes receiving said article along the inner side of said path.

4,096,732

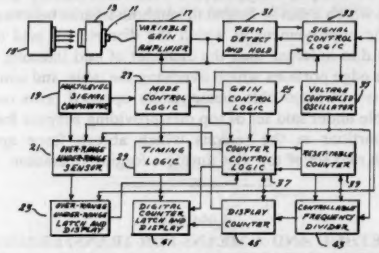
CAMERA TESTING METHODS AND APPARATUS

Barry R. Springer, 10301 Margarita Ave., Fountain Valley, Calif. 92708

Filed Aug. 19, 1977, Ser. No. 826,109
Int. Cl.[2] G03B *43/00*
U.S. Cl. 73—5 24 Claims

1. The method of testing a camera comprising the steps of generating an analog signal pulse responsive to the illuminance admitted during each camera shutter operation,

defining the period of each said analog signal pulse by means of a set minimum signal amplitude threshold, and



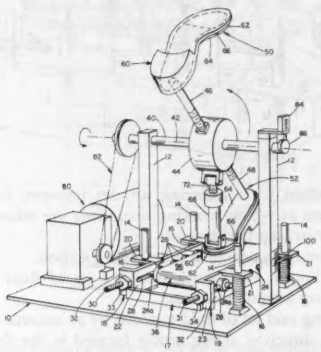
determining the cinematic frame rate of said camera in frames per second as being the reciprocal of the time period, in seconds, between the beginning of two successive signal pulses.

4,096,733

TESTING FOOTWEAR SOLES

Arnold Cohen, Marblehead, Mass., assignor to Jones & Vining, Incorporated, Braintree, Mass.

Filed Sep. 17, 1975, Ser. No. 614,250
Int. Cl.[2] G01N *3/56*
U.S. Cl. 73—7 **12 Claims**



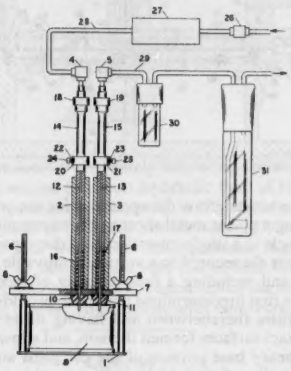
1. Apparatus for testing footwear soles, comprising a frame,
treadmill supports mounted on said frame for movement along an axis,
a treadmill assembly mounted on said supports, said assembly including an operative treadmill surface movable in its own plane along a direction transverse to said axis,
resilient means connected to said frame and said supports for biasing said treadmill surface in a rest position and for resiliently opposing movement of said surface along said axis away from said rest position to a range of operating positions,
a shaft mounted on said frame, said shaft being located with its longitudinal axis parallel to said operative treadmill surface and spaced from said rest position of said surface in the direction away from its said range of operating positions,
a drive for rotating said shaft above its said axis, and
a sole support mounted on said shaft at a distance from said shaft axis sufficient so that when a sole to be tested is installed on said sole support and said shaft is rotated by said drive, said sole support will carry said sole along said operative treadmill surface to move said surface along its said plane and, against the resilient force of said resilient means, to said range of operating positions,
said frame including a base and a plurality of posts on said base, said posts extending through openings in said treadmill supports, said resilient means comprising coil springs around said posts between said base and said supports.

4,096,734

METHOD OF REMOVING HEADSPACE VOLATILES AND ANALYSIS THEREOF

Ali Khayat, Carlsbad, Calif., assignor to Ralston Purina Company, St. Louis, Mo.

Filed Jan. 21, 1977, Ser. No. 760,872
Int. Cl.[2] G01N *31/08*
U.S. Cl. 73—23.1 **19 Claims**



1. A method of removing volatiles present in the headspace area of a sealed container without prematurely releasing the vacuum and said volatiles in said container comprising the steps of:
(a) inserting a first penetrating means into the headspace area of a sealed container,
(b) inserting a second penetrating means into said headspace area of said container,
(c) passing an inert carrier gas into said headspace area of said container through said penetrating means,
(d) withdrawing said inert carrier gas and volatiles from said headspace area in said container through said penetrating means other than the means utilized for the passing of said inert carrier gas into said container.

4,096,735

ENGINE DETONATION SENSOR WITH DOUBLE SHIELDED CASE

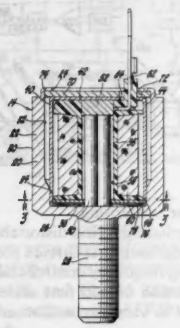
Gerald O. Huntzinger; Charles E. Buck, and Robert E. Campbell, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 767,995, Feb. 11, 1977, abandoned. This application Sep. 1, 1977, Ser. No. 829,778
Int. Cl.[2] G01P *15/08*; H01L *41/14*
U.S. Cl. 73—35 **2 Claims**

1. A detonation sensor for a vehicle mounted engine comprising, in combination:
an elongated magnetostrictive element;
means associated with the magnetostrictive element effective to establish a magnetic flux therethrough;
a pickup coil disposed around the magnetostrictive element and responsive to changes in the magnetic flux through the magnetostrictive element to convert said changes into electrical output signals;
a generally cylindrical outer case comprising a magnetic material and having a closed axial end with means for attachment to the engine for vibration therewith and an open axial end, the magnetostrictive element being dis-

posed coaxially within the case, the outer case forming a first shield for the magnetostrictive element from external magnetic fields;

a generally cylindrical inner case comprising a magnetic material and being disposed coaxially within the outer case and around the magnetostrictive element to form a second shield for the magnetostrictive element from external magnetic fields, the inner case having a closed end adjacent the end of the magnetostrictive element opposite



the closed end of the outer case and an open end adjacent the closed end of the outer case;

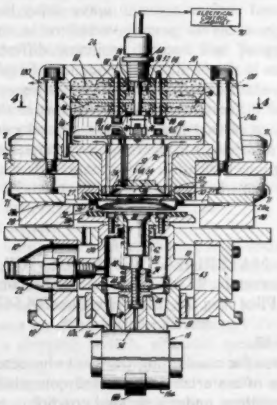
means on the open axial end of the outer case operatively engaging the closed end of the inner case and biasing the inner and outer cases toward each other, the closed ends of the inner and outer cases operatively engaging and compressing the magnetostrictive element in compressive preload, whereby vibrations of the engine cause corresponding variations in said magnetic flux and thus in said electrical output signals.

4,096,736

ULTRASONIC LEAK HOLE DETECTION APPARATUS AND METHOD

Gary S. Moshier, North Haledon, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Feb. 25, 1977, Ser. No. 772,330
Int. Cl.[2] G01M *3/24*
U.S. Cl. 73—40 **12 Claims**



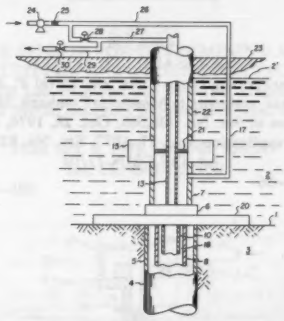
1. A leak detecting device for identification of can tops and similar workpieces with leak holes comprising a compressed gas supply chamber providing a source of compressed gas for testing the workpieces for leaks; an acoustic testing chamber mounted adjacent said gas supply chamber; sealing means between said chambers for holding a workpiece in a gas tight press wherein one side of the workpiece faces said compressed gas supply chamber in a gas tight relationship and the other side of said workpiece faces said acoustic testing chamber in a noise tight relationship; valve means on said compressed gas supply chamber, said valve means being operable to admit compressed gas from said gas supply chamber to the side of said workpiece facing said compressed gas supply chamber; an ultrasonic microphone within said acoustic testing chamber adapted for detecting gas noise created by gas passing through a leak hole in the workpiece; a gas venting port disposed adjacent the periphery of said microphone and communicating with a labyrinth baffle with a gas vent passage leading to the atmosphere; and electrical control means for receiving gas leak noise signals from said microphone after said valve means has opened and for rejecting workpieces giving off gas leak noise signals.

4,096,737

UNDERWATER WELLHEAD TESTING

Frank J. Schuh, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 7, 1977, Ser. No. 848,835
Int. Cl.[2] G01M *3/14*
U.S. Cl. 73—46 **5 Claims**



1. A method for pressure testing a packoff between a casing hanger and an underwater wellhead wherein the casing supported by said casing hanger has a pressure rating above which said casing may collapse, said packoff sealing an annulus around the outside of said casing so that during pressure testing of said packoff if said packoff should leak said annulus around said casing will be pressurized and could possibly be pressurized beyond its collapse pressure, said casing having a drill string communicating with the interior thereof, the improvement comprising pressuring the interior of said casing through said drill string so as to maintain the differential pressure across said casing within said casing's collapse rating so that if said packoff does leak, the pressure buildup in said annulus around said casing will not exceed said casing's collapse rating, and during said interior pressurizing of said casing regulating the internal pressure of said casing so that such internal pressure does not exceed the burst rating of said casing.

4,096,738

METHOD FOR TESTING FILLED GLASS CONTAINERS

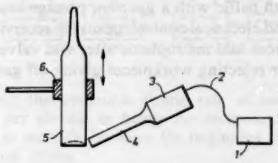
Roland Rupp, Leverkusen; Hildegard Schnoring, Wuppertal; Erhard Schellmann, Cologne, and Kurt Bauer, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 9, 1977, Ser. No. 776,051

Claims priority, application Germany, Mar. 25, 1976, 26128096

Int. Cl.[2] G01M *7/00*

U.S. Cl. 73—52 8 Claims



1. A method for testing filled glass containers in particular, ampoules for leaks and mechanical strength, comprising bringing the containers into an ultrasonic wave field produced by an ultrasonic source, without impact between the containers and the source and setting the intensity of the ultrasonic source to intensity at a predetermined frequency to destroy defective containers, while mechanically perfect containers remain unaffected.

4,096,739

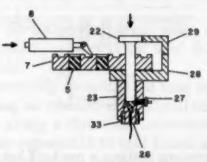
PROCESSABILITY TESTER

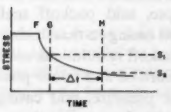
Robert I. Barker, Cuyahoga Falls, and David P. King, Akron, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 736,508, Oct. 28, 1976, abandoned. This application Aug. 17, 1977, Ser. No. 825,538

Int. Cl.[2] G01N *11/04*

U.S. Cl. 73—56 10 Claims





1. In the method of evaluating an extrudable material by charging a supply of such material to a chamber having an outlet and movable member for forcing the material through the outlet and moving said member to force material from the outlet, the improvement which comprises stopping and securing the movable member at a predetermined position and measuring the force on the material as it decays with time.

4,096,740

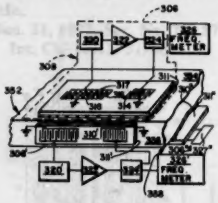
SURFACE ACOUSTIC WAVE STRAIN DETECTOR AND GAGE

Gary F. Sallée, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 17, 1974, Ser. No. 479,961

Int. Cl.[2] G01B *7/16;* G01N *29/00*

U.S. Cl. 73—88.5 R 7 Claims



2. A strain detector comprising:

a first oscillator including a first distortable frequency control element comprising first surface acoustic wave delay line means having frequency control characteristics which vary upon distortion of said first surface acoustic wave delay line means to vary the oscillation frequency of said first oscillator;

a second oscillator including a second distortable frequency control element comprising second surface acoustic wave delay line means having frequency control characteristics which vary upon distortion of said second surface acoustic wave delay line means to vary the oscillation frequency of said second oscillator;

a third oscillator including a third distortable frequency control element comprising third surface acoustic wave delay line means having frequency control characteristics which vary upon distortion of said third surface acoustic wave delay line means to vary the oscillation frequency of said third oscillator; and

support means for affixing said first surface acoustic wave delay line means to a surface of a member in which strain is to be monitored, for affixing said second surface acoustic wave delay line means to a different surface of said member than that to which said first surface acoustic wave delay line means is affixed and for affixing said third surface acoustic wave delay line means to a different surface of said member than those to which said first and said second surface acoustic wave delay line means are affixed, in order to permit variations in the oscillation frequency of said second oscillator different from the variations in the oscillation frequency of said first oscillator and variations in the oscillation frequency of said third oscillator different from the variations in the oscillation frequencies of said first and said second oscillators such that the differences in the frequency variations provide an unambiguous indication of the magnitude and direction of strain in said member.

4,096,741

MATERIALS TESTING DEVICE

Sanford S. Sternstein, 9 Oak Tree La., Schenectady, N.Y. 12309

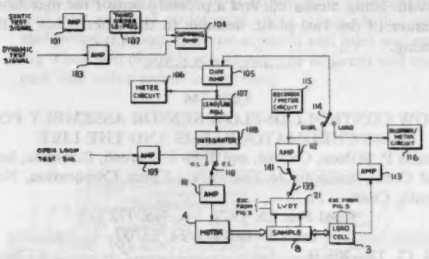
Filed Aug. 23, 1976, Ser. No. 716,647

Int. Cl.[2] G01N *3/08*

U.S. Cl. 73—90 12 Claims

1. Apparatus for conducting transient characterization tests on specimens of materials to be tested comprising means for securing a specimen under a no load condition, an electrically actuable direct current voice coil shaker motor secured to one end of said means whereby to apply a force rapidly to a specimen, command means for selectively applying an electrical step function actuation signal to said shaker motor, means for producing an electrical response signal indicative of a predetermined parameter related to the force applied to the speci-

men, a motor control circuit responsive to said response signal for maintaining said parameter at a specified magnitude, said



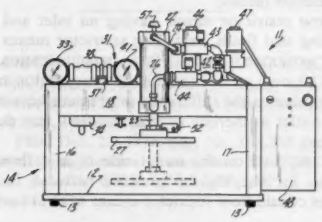
motor control circuit producing a d.c. signal directly coupled to said motor.

4,096,742

FLEXING DEVICE FOR TESTING RESILIENT ARTICLES AND METHOD OF COMPRESSION TESTING

Thomas Carl Musolf, and Harold Thomas Wyman, both of Southgate, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Feb. 16, 1977, Ser. No. 769,355
Int. Cl.[2] G01N *3/10*
U.S. Cl. 73—94 **8 Claims**



1. A flexing device for use in testing flexible foam articles comprising

a bed for receiving samples in a testing position,

support means carried on the bed,

a fluid operated cylinder mounted on said support means,

said cylinder comprising a piston, a first passage means for providing fluid to one side of the piston, a second passage means for providing fluid to the other side of the piston, and a pressure foot member attached to the piston and mounted to move into the testing position,

conduit means for carrying fluid to and from said first and second passage means,

a source of fluid under pressure in communication with said conduit means,

an exhaust means,

switching valve means for supplying fluid under pressure to one of said first and second passage means and for switching fluid from the other of said first and second passage means to said exhaust means,

circuit means for operating the switching valve means comprising a stepping switch, solenoid means for operating the switching valve in positions corresponding to positions of the stepping switch, and a pulse operated drive mechanism for driving the stepping switch,

first switch means mounted on said support means for actuation on an extended movement of the piston, and

a second switch means mounted on said support means for actuation on a retracted movement of the piston

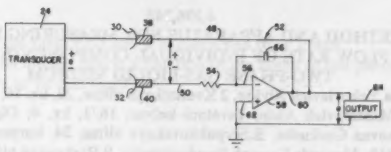
said first and second switch means being located to provide pulses to said pulse operated drive mechanism whereby the stepping switch is moved at each end of the movement of the piston for providing automatic operation through the stepping switch sequence.

4,096,743

SHAFT TORQUE MEASURING SYSTEM

Joseph M. Diamond, Brooklyn, N.Y., assignor to McNab, Incorporated, Mount Vernon, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,558
Int. Cl.[2] G01L *3/10*
U.S. Cl. 73—136 A **6 Claims**



1. In a shaft torque measuring system of the type having transducer means producing an electrical signal representing shaft torque and brush and slip ring means providing an output connection for the electrical shaft torque signal, the improvement comprising

operational amplifier means including an inverting input terminal and an output terminal;

input means for coupling the electrical shaft torque signal from the output connection of the brush and slip ring means to said operational amplifier means between said inverting input terminal and said output terminal; and

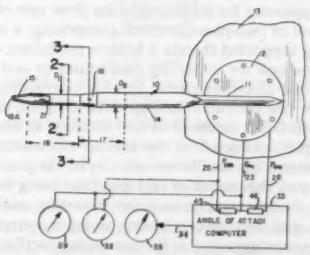
output means coupled to said output terminal of said operational amplifier means providing an output signal representative of shaft torque whereby resistance variations or circuit interruptions in the brush and slip ring means do not adversely affect said shaft torque output signal.

4,096,744

PRESSURE SENSOR FOR DETERMINING AIRSPEED, ALTITUDE AND ANGLE OF ATTACK

Richard V. De Leo, Hopkins, and Floyd W. Hagen, Eden Prairie, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Sep. 5, 1975, Ser. No. 610,579
Int. Cl.[2] G01C *21/00*
U.S. Cl. 73—180 **18 Claims**



1. An air data sensing probe of use in fluid streams, comprising a barrel having a longitudinal axia, said barrel having a first leading end facing a preselected direction, and a second end spaced from said first end along said longitudinal axis, means to attach said second end of said barrel to an object, first pressure sensing port means formed in a first section of said barrel spaced from both ends thereof and being arranged to sense static pressure of fluid surrounding said barrel where there is relative motion between a fluid surrounding said barrel and said barrel, and second pressure sensing port means

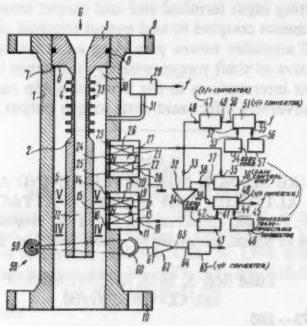
formed in said barrel to independently sense pressure at the surface of said barrel, and said second port means being positioned at a location spaced axially along said barrel from said first pressure sensing port means so that the pressures at the first and second pressure sensing port means change relative to each other when the longitudinal axis of said barrel deviates from a reference position, means to provide a pitot pressure signal due to relative motion between said barrel and the surrounding fluid, and means to combine the sensed pressures and pitot pressure signal to provide an indication of the angle of attack comprising the angle of the longitudinal axis of said barrel with respect to said reference position.

4,096,745

METHOD AND APPARATUS FOR MEASURING MASS FLOW RATE OF INDIVIDUAL COMPONENTS OF TWO-PHASE GAS-LIQUID MEDIUM

Ilya Yakovlevich Rivkin, 2 Kvesisskaya ulitsa, 22, kv. 16; Shamil Mustafovich Aisin, Tsvetnoi bulvar, 16/1, kv. 4; Olga Ivanovna Garkusha, B.Serpukhovskaya ulitsa, 34, korpus 5, kv. 245; Alexandr Lvovich Dondoshansky, 9 Parkovaya ulitsa, 47, korpus 1, kv. 70; Evgeny Alfredovich Zellis, Kashirskoe shosse, 100, stroenie 1, kv. 44; Vladilen Efremovich Karpov, ulitsa Miklukho-Maklaya, 65, korpus 4, kv. 86; Vladimir Konstantinovich Sorokin, Leninsky prospekt, 37, kv. 26, and Oleg Petrovich Shishkin, prospekt Vernadskogo, 89/1, kv. 111, all of Moscow, U.S.S.R.

Filed Feb. 13, 1976, Ser. No. 657,840
Int. Cl.[2] G01F *1/66, 1/76*
U.S. Cl. 73—194 B **10 Claims**



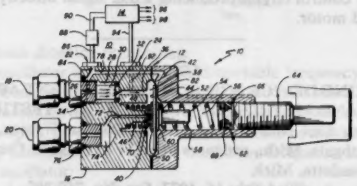
1. An apparatus for measuring mass flow rate of individual components of two-phase medium comprising: a sealed housing having supported therein a hollow pendulum; a first electromagnetic coil for imparting oscillations to said pendulum, and a second electromagnetic coil for converting oscillation velocity of said pendulum into an electric signal, said first and second coils being mounted on said housing; an amplifier having an input connected to the second electromagnetic coil, which converts the oscillation velocity of the pendulum and a control input, the output of said amplifier being connected to said first electromagnetic coil for imparting oscillations; an automatic gain control unit having an input connected to said second electromagnetic coil for converting oscillation velocity and an output connected to said control input of said amplifier; a first voltage-to-frequency converter having an input connected to said output of said automatic gain control unit; a first zero corrector connected to said first voltage-to-frequency converter; a first conversion transconductance corrector connected to said first voltage-to-frequency converter whose output frequency signal is proportional to mass flow rate of a two-phase medium being measure; a frequency-to-voltage converter having an input and output; a second voltage-to-frequency converter having an input connected to said output of said frequency-to-voltage converter; a second zero corrector connected to said second voltage-to-frequency converter; a second conversion transconductance corrector connected to said second voltage-to-frequency converter whose output frequency signal is proportional to density of the two-phase medium being measured; and a pressure sensor for measuring pressure of the two-phase medium in the inner space of the housing.

4,096,746

FLOW CONTROLLER-FLOW SENSOR ASSEMBLY FOR GAS CHROMATOGRAPHS AND THE LIKE

Francis P. Wilson, Oxford, and John E. Purcell, Riverside, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 25, 1977, Ser. No. 772,179
Int. Cl.[2] G01F *1/34, 25/00*
U.S. Cl. 73—205 R **6 Claims**



1. A flow controller-flow sensor assembly for regulating the flow of fluid through a system, comprising, in combination:

inlet channel means;

first flow restrictor means having an inlet and outlet for passing said fluids, said flow restrictor means having its inlet positioned in fluid flow communication with said inlet channel means, said first flow restrictor means being responsive to the difference in pressure between its inlet and outlet to thereby control the flow rate through said system;

means disposed on the outlet side of said flow restrictor means for varying the pressure between the inlet and outlet of said flow restrictor means so as to vary said flow rate;

outlet channel means in fluid flow communication with the outlet of said restrictor means for returning the fluid within the controller to the system;

transducer means having a first and a second port;

means for connecting said first port to the inlet of said flow restrictor means in fluid flow communication;

said transducer means including means for generating an electrical signal proportional to the pressure difference between said first and second ports;

said means for connecting said first port to the inlet of said flow restrictor means including a second flow restrictor means, said second flow restrictor means having substantially the same flow rate characteristics as the first flow restrictor means so that the time it takes for said first port to sense the pressure at the inlet of said first flow restrictor means is substantially equal to the time it takes for the pressure at the outlet of said first flow restrictor means to build up to its anticipated value based on the setting of said means for varying the pressure between the inlet and outlet of said first flow restrictor means.

4,096,747

DIGITAL OUTPUT, POSITIVE DISPLACEMENT FLOW METER

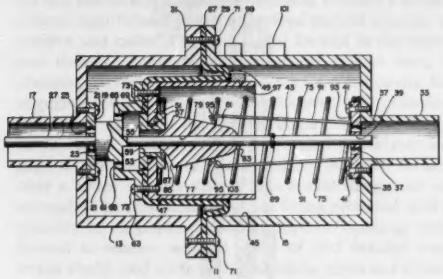
Paul R. Gilson, 10012 Highcliff Dr., Santa Ana, Calif. 92705

Filed Oct. 14, 1975, Ser. No. 621,884
Int. Cl.[2] G01F *3/16*
U.S. Cl. 73—251 **25 Claims**

14. A meter for measuring the flow of a fluid, comprising: a housing having an inlet and an outlet;

a piston mounted for reciprocation within said housing between a pair of extremes adjacent said inlet and said outlet;

valve means for bypassing fluid around said piston between said inlet and said outlet, said valve means closing when said piston is at said extreme adjacent said inlet and opening when said piston is at said extreme adjacent said outlet end; said valve means comprising:



an orifice for bypassing fluid around said piston; and

a valve member selectively closing against the downstream end of said orifice;

means for biasing said piston toward said extreme adjacent said inlet end; and

means for producing an output signal in response to the position of said piston within said cylinder.

4,096,748

WHEATSTONE BRIDGE MEASURING CIRCUIT

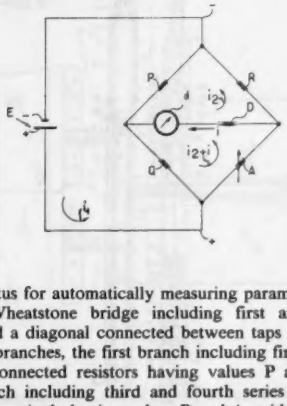
Michel Pichon, Fontenay, Bois, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 22, 1976, Ser. No. 753,305

Claims priority, application France, Dec. 31, 1975, 75 40363

Int. Cl.[2] G01K 7/20; G05F 3/02

U.S. Cl. 73—362 AR 9 Claims



1. Apparatus for automatically measuring parameters comprising a Wheatstone bridge including first and second branches and a diagonal connected between taps of the first and second branches, the first branch including first and second series connected resistors having values P and Q, the second branch including third and fourth series connected resistors, respectively having values R and A, said third resistor being responsive to the measured parameter in accordance with:

$$R = \frac{(1 + \alpha_o T)}{R_0} \quad (1)$$

where:

R_o = the value of said third resistor when said parameter has a value T_o;

T = the value of the parameter sensed by the third resistor, and

α_o = the temperature coefficient of said third resistor,

the diagonal including a voltage detector having an internal resistance D, the voltage detector being connected to a common terminal of the first and second resistances and a common terminal of the third and fourth resistors; a voltage source for energizing the bridge, the source having a value E, such that:

$$E = \frac{(k + 1)^2}{\alpha_o k} \cdot 10^{-n} \quad (2)$$

where

k = the ratio P/Q and k is much less than 1; and

n = an integer that is a function of the range of the parameters to be measured.

4,096,749

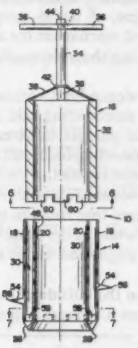
CORE SAMPLING DEVICE

Robert A. Stewart, 2844 54th St., North, St. Petersburg, Fla. 33710

Filed Apr. 29, 1977, Ser. No. 792,465

Int. Cl.[2] B28B 7/10; G01N 1/08

U.S. Cl. 73—425.2 8 Claims



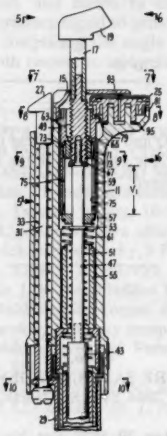
1. A core sampling device of the type primarily intended for forming concrete test cores in situ and facilitating the removal of such test cores, said core sampling device comprising: sleeve means comprising first wall means defining the exterior of said device and second wall means correspondingly configured as said first wall means and disposed within said first wall means, said first and second wall means being interconnected at their bases; a plurality of insertion ledge means formed in interconnecting relation between said first and second wall means bases; and insertion means removably engageable with said sleeve means, said insertion means comprising body means dimensioned and configured for being removably disposed within the space defined between said first and second wall means, said insertion means further comprising a plurality of insertion finger means formed around a peripheral edge of said body means, said finger means being dimensioned and configured to operatively engage said insertion ledge means, whereby said insertion means may be utilized to place said sleeve means within fluid concrete to form a test core at least partially defined by said second wall means.

4,096,750

HAND-HELD MICROPIPETTOR WITH FLUID TRANSFER VOLUME ADJUSTMENT MECHANISM

Ronald Leo Sturm, San Carlos, Calif., assignor to Oxford Laboratories Inc., Foster City, Calif.

Filed Jun. 15, 1977, Ser. No. 806,910
Int. Cl.[2] B01L *3/02*
U.S. Cl. 73—425.6 **8 Claims**



1. In a device having a plunger reciprocal within a body through a stroke distance defined by limiting abutments for transferring a volume of liquid proportional to the stroke distance, an improved mechanism for adjusting an abutment on the plunger for varying the volume of liquid transferred, comprising:

a cylindrical-like sleeve held within said body against axial movement and surrounding said plunger,

a nut held on said plunger in threaded engagement therewith, said nut travelling back and forth along the length of said plunger when rotated,

means operably connecting said nut and said cylindrical sleeve in a manner that rotation of the sleeve causes rotation of the nut while at the same time permitting reciprocation of the plunger and nut as a nut with respect to the sleeve, and

means provided on the outside of said body for rotating said cylinder to effect a volume adjustment.

4,096,751

HAND-HELD MICROPIPETTOR WITH FLUID TRANSFER VOLUME ADJUSTMENT MECHANISM

Stanley J. Withers, Berkeley, and Ronald L. Sturm, San Carlos, both of Calif., assignors to Oxford Laboratories Inc., Foster City, Calif.

Filed Jun. 15, 1977, Ser. No. 806,909
Int. Cl.[2] B01L *3/02*
U.S. Cl. 73—425.6 **5 Claims**

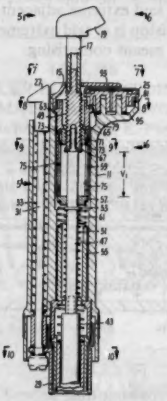
1. In a device having a plunger reciprocal within a body through a defined stroke distance set by limiting abuttments for transferring a volume of fluid proportional to the stroke distance, an improved mechanism for adjusting an abuttment on the plunger for continuously varying the volume of liquid transferred, comprising:

a volume adjustment knob located external of said body,

a motion transmitting element held within said body surrounding a portion of said plunger and held to be rotatable with respect to the body in response to rotation of said volume adjustment knob,

an adjustable stop carried by said plunger within said motion transmitting element and operably connected therewith in a manner that rotation of said element causes said stop to move axially along said plunger,

means within said body for normally restraining movement of said element, and



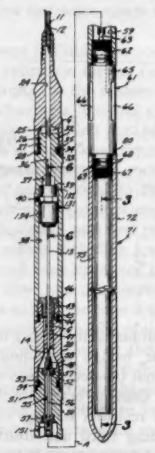
means responsive to said plunger being placed at a particular position for releasing said element restraining means, whereby movement of said volume adjustment knob is automatically locked unless the operator deliverately places the plunger in a particular position, thus avoiding inadvertent volume setting changes.

4,096,752

OIL WELL LOGGING PROBE ASSEMBLY

Gerald J. Tonnelli, Long Beach, Calif., assignor to Production Data Inc., Bakersfield, Calif.

Filed Jul. 6, 1976, Ser. No. 702,915
Int. Cl.[2] E21B *47/024;* H02G *15/22*
U.S. Cl. 73—431 **5 Claims**



1. In a cylindrical probe assembly adapted to include selected instruments arranged in a cylindrical stack each instrument communicating by way of a common coaxial cable having a braided wire strand shield thereof connected to support said probe assembly, the improvement comprising:

an annular guide segment including a first central bore conformed to the exterior of said cable, a first cavity axially aligned with said first central bore on the lower end of said segment a first threaded peripheral surface formed on the

interior surface of said first cavity, and a first sealing peripheral surface formed along said threaded first peripheral surface proximate the lower end of said segment;

an annular attachment segment including a first reduced diameter section at the upper end thereof adapted for receipt within said first cavity for threadable engagement therewith and including a first sealing ring disposed peripherally thereabout to abut said first sealing peripheral surface said attachment segment further includes a second central bore formed in the upper end thereof adapted to receive said cable, a second cavity formed in the lower end thereof communicating with said second bore, a clamping device disposed within said second cavity for engaging the shield of said cable thereat, said clamping device having a male fitting including a peripheral flange on the upper portion thereof conformed to sealably engage said second cavity, and exteriorly threaded surface over a lower portion thereof below said flange and an internally threaded annular female fitting provided with a plurality of longitudinal radially disposed openings conformed to receive selected wires of said braided wire strand shield, said wires extending to the upper end of said female fitting to be secured by compression against said flange and a second threaded and sealing peripheral surface formed on the interior periphery of said second cavity proximate the lower end thereof; and

said fluid includes a non-conducting grease compound deposited in said first cavity prior to the receipt of said first section therein.

4,096,753

MINE EQUIPMENT

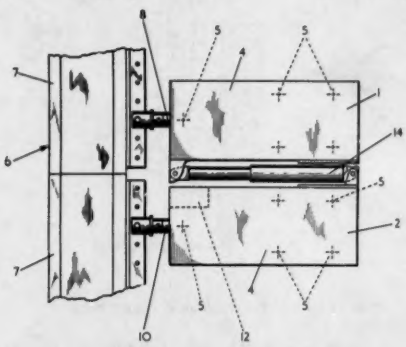
Rex Mullins, Burton Upon Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 618,163, Sep. 30, 1975, abandoned. This application Mar. 17, 1977, Ser. No. 778,547

Claims priority, application United Kingdom, Nov. 19, 1974, 50091/74

Int. Cl.² G01B 7/14

U.S. Cl. 73—432 R **9 Claims**



1. Mine equipment for measuring the advance of a longwall face conveyor including a plurality of articulately connected sections, comprising first and second components adapted to be releasably anchored adjacent to a mine goaf behind the conveyor, each of the components being capable of being advanced relative to the other component, control means for controlling actuation of the components such that, in use, each of the components is advanceable only when the other component is anchored, and sensor means associated with both the components and sensitive to movement of at least one of the components relative to the other component.

4,096,754

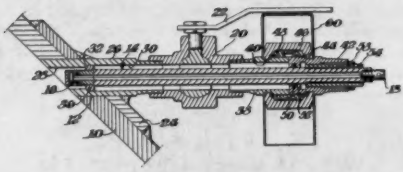
REMOVABLE PROBE

Wendell Hazelton Beveridge, Jr., Claremont, and William Edward Van Over, Monrovia, both of Calif., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 26, 1977, Ser. No. 828,144

Int. Cl.² G01L 19/00

U.S. Cl. 73—432 R **8 Claims**



1. A mounting for removably introducing a probe into a fluid enclosure, said mounting including a boss having a bore and a counter bore forming a positioning shoulder therebetween and penetrating said enclosure, a valve connected to said boss, and an extension pipe connected to said valve, comprising:

a removable housing in fluid tight end-to-end relation with said pipe and having a bore of lesser diameter than the internal diameter of said pipe to form a retaining shoulder therebetween,

coupling means to secure said pipe and said housing in said end-to-end relationship,

said housing, said pipe, said valve and said boss forming a continuous passageway for said probe into said enclosure,

said probe having a collar continguous one end for seating on said positioning shoulder or abutting said retaining shoulder, and

means for maintaining said probe collar seated on said positioning shoulder.

4,096,755

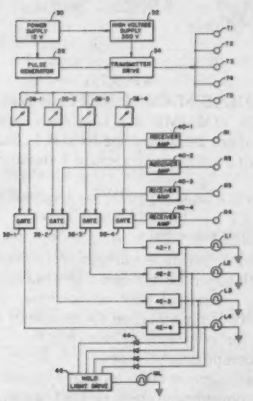
ULTRASONIC INSPECTION APPARATUS

Leroy Robert Hause, Seattle, and Clarence William Coplin, Auburn, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 31, 1977, Ser. No. 829,400

Int. Cl.² G01N 29/04

U.S. Cl. 73—598 **8 Claims**



1. Ultrasonic inspection apparatus comprising a carriage movable over a surface to be ultrasonically inspected, alternate transmitting and receiving ultrasonic transducers mounted on said carriage in a linear array and in contact with the surface to

be inspected such that ultrasonic wave energy from a transmitting transducer will pass through the surface to an adjacent receiving transducer, means for causing each of said transmitting transducers to generate a burst of sound in the surface, a separate detector for each of said receiving transducers for detecting a shift in phase in the sound received by its associated receiving transducer due to a defect in the surface, a separate indicator for each of the receiving transducers for momentarily indicating a shift in phase indicative of a defect, a single master indicator for all of said receiving transducers, and means for actuating said master indicator for a predetermined period of time longer than the momentary indications of the separate indicators whenever a defect is sensed by any of the separate detectors.

4,096,756

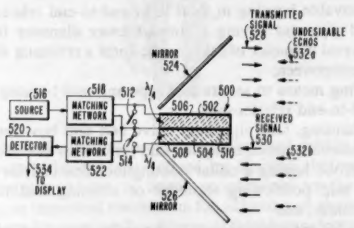
VARIABLE ACOUSTIC WAVE ENERGY TRANSFER-CHARACTERISTIC CONTROL DEVICE

Gerard Argant Alphonse, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 812,706

Int. Cl.[2] G01N *29/00;* **H03H** *9/26;* **H01L** *41/10*

U.S. Cl. 73—609 **12 Claims**



1. A variable acoustic wave energy transfer characteristic control device including:

a piezoelectric unit comprising a plurality of contiguous layers of piezoelectric material which define two outer faces and define an interface between each pair of adjacent ones of said contiguous layers, each of said layers having a respective specified thickness, first and second electrodes respectively at said outer faces, and at least one additional electrode at each interface;

an electrical circuit connected across said first and second electrodes; and

switch means for selectively connecting said at least one additional electrode to another one of said electrodes which selectively short circuits at least a portion of at least one of said layers of said piezoelectric element.

4,096,757

METHOD AND APPARATUS FOR EXAMINING WELD DEFECTS IN VERTICAL PIPES BY SUPERSONIC WAVES

Ryoichi Ishii; Yoshishige Sakurai; Hiroshi Yamada; Kuniharu Uchida, all of Yokohama, and Kanekichi Suzuki, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 7, 1976, Ser. No. 748,370

Claims priority, application Japan, Dec. 8, 1975, 50-145141; Dec. 8, 1975, 50-145143; Dec. 12, 1975, 50-147422; Dec. 12, 1975, 50-147423

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—621 **13 Claims**

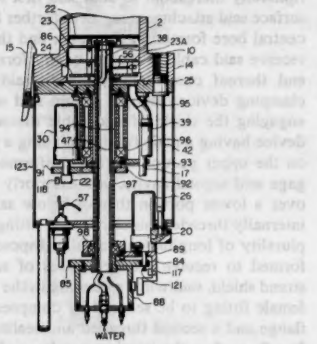
1. Supersonic defect detection apparatus for examining the weld of a vertical pipe comprising:

a supersonic probe,

means for revolving said probe along the inner surface of said vertical pipe, said probe revolving means including a first disc mounted on a rotary shaft,

means removably connected to the lower end of said pipe for vertically driving said probe revolving means,

means connected to said vertically driving means for circulating contact liquid between the operating surface of said probe and a tank containing said contact liquid, and



means for supplying said contact medium onto said first disc including a baffle plate mounted above said first disc for directing said contact liquid in the radial direction of said first disc, said probe being positioned beneath said first disc near the periphery thereof, and said first disc being provided with a notch above said probe for guiding the contact liquid between the operating surface of said probe and the inner wall of said pipe to be examined.

4,096,758

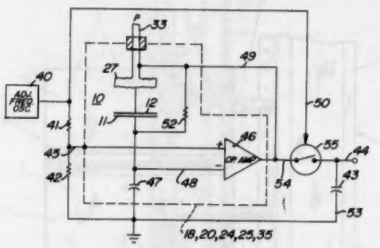
PRESSURE TO ELECTRIC TRANSDUCER

James O. Moore, Worcester Township, Montgomery County, Pa., assignor to Moore Products Co., Spring House, Pa.

Filed May 24, 1977, Ser. No. 799,957

Int. Cl.[2] G01L *9/12*

U.S. Cl. 73—718 **10 Claims**



1. A pressure-to-electric transducer comprising

a housing,

a fluid pressure responsive member in said housing,

a capacitor in said housing having a fixed plate and a movable plate connected to said fluid pressure responsive member for movement thereby,

an operational amplifier for delivery of an output signal,

said amplifier having a negative input terminal, a positive input terminal and an output terminal,

means for determining the output of said amplifier in response to a fluid pressure applied at said fluid pressure responsive member,

said means comprising an oscillator as an input source connected to said positive input terminal, and

a feedback network including said capacitor and a resistor

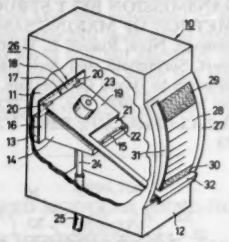
connected between said output terminal and said negative input terminal of said amplifier for controlling the gain of said amplifier.

4,096,759

PRESSURE GAUGE FOR INDICATING SMALL PRESSURE CHANGES

Gerhard Desor, Bad Homburg, Germany, assignor to Hauser Verwaltungs-Gesellschaft mit beschrankter Haftung, Oberursel, Germany

Filed Mar. 7, 1977, Ser. No. 775,351
Claims priority, application Germany, Mar. 10, 1976, 2609882
Int. Cl.[2] G01L *7/00*
U.S. Cl. 73—731 **16 Claims**



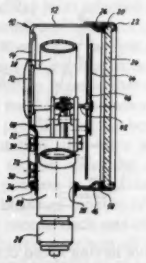
1. A pressure gauge for indicating small pressure changes comprising a sac of thin flexible film material communicable with and inflatable by the pressure to be indicated, during use; a base for supporting the sac wherein the sac effectively inflates generally outwardly therefrom, during use; a transmission plate; means pivotally mounting the transmission plate to rest freely against the sac, comprising a hinge connecting the transmission plate to the base for free swinging movement of the transmission plate in response to the inflation and deflation of the sac; and a pointer directly connected to the transmission plate to indicate the position thereof under the influence of pressure to the sac to effect the indication of that pressure.

4,096,760

PRESSURE GAUGE

Paul Bilbert, Burgstadt, and Ewald Rössner, Obernburg, both of Germany, assignors to Alexander Wiegand GmbH u. Co., Armaturen- u.Manometerfabrik, Klingenberg, Germany

Filed Jun. 10, 1977, Ser. No. 805,603
Int. Cl.[2] G01L *7/04*
U.S. Cl. 73—738 **4 Claims**



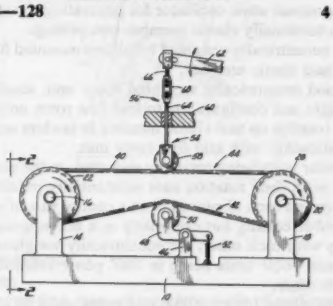
1. A pressure gauge comprising
a rigid housing having a peripheral wall, a front side and a rear side;
a view plate mounted to seal said front side;
a gauge member located within said housing;
an elongated gauge support member having one end extending outside said housing to provide a support for said pressure gauge and its other end extending inside said housing to provide a mounting for said gauge member;
a pointer mechanism and pointer connected with said gauge member for articulated movement observable through said view plate;
said rear side formed as a wall having an opening therein formed with an edge thereof;
a closure element corresponding in size to said opening and having a first groove extending about its periphery to sealingly engage said edge of said opening thereby retaining said closure element in said opening;
said closure element having a second groove extending about its periphery, said second groove located so as to provide an opening into the interior of said housing;
a resilient membrane extending into said housing and having its edge sealingly secured within said second groove opening along its entire length; and
said closure element having a vent hole and capable of being pressed out of said opening when the pressure in said housing exceeds a specific value.

4,096,761

APPARATUS AND METHOD FOR INCREMENTALLY ROTATING A SHAFT

Keith E. Brown, Solon, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Jul. 15, 1976, Ser. No. 705,688
Int. Cl.[2] F16H *27/02*
U.S. Cl. 74—128 **4 Claims**



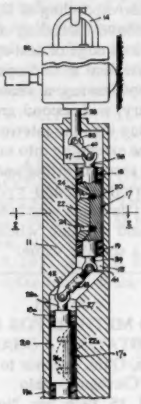
1. An apparatus for providing intermittent rotary motion in a predetermined direction comprising:
an endless substantially nonstretchable belt;
a pair of spaced driven pulleys around which said belt is trained with said belt having first and second continuous runs each disposed between said pulleys and each extending from one pulley to the other, said pulleys having their axes fixedly positioned and the length of the belt being such as to normally exhibit significant slack when thus trained arond the pulleys;
means for preventing rotation of each pulley in one direction while permitting it in the other, the directions of permitted rotation of the pulleys being alike with respect to a single predetermined direction of belt travel;
first deflecting means for alternately deflecting said first run of the belt in a direction transversely of its path and then withdrawing trom the deflecting position; and
second deflecting means for alternately deflecting the second run of the belt in a direction transversely of its path and then withdrawing from the deflecting position, said first and second deflecting means being arranged for mutual coaction such that the deflecting and withdrawing actions alternate in opposite sense to the actions of the other so as to maintain said belt substantially taut about the pulleys, whereby the pulleys are alternately stepped in their permitted directions of rotation.

4,096,762

TORSIONAL SONIC OSCILLATOR EMPLOYING UNIVERSAL JOINTS AND TANDEM ARRANGED OSCILLATOR ROTORS

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Jul. 30, 1976, Ser. No. 710,317
Int. Cl.[2] F16H *33/00*
U.S. Cl. 74—61 11 Claims



1. A torsional sonic oscillator for generating torsional vibration in a torsionally elastic member comprising:

a first eccentrically weighted rotor unit mounted for rotation on said elastic member,

a second eccentrically weighted rotor unit, similar in size, weight and configuration to said first rotor unit, mounted for rotation on said elastic member in tandem series driven relationship with said first rotor unit,

said rotor units being rotatably mounted on the elastic member with their rotation axes substantially parallel to each other and each displaced from a central axis of said elastic member equally but oppositely in a non-aligned relationship with each other, the eccentrically weighted portions of said rotor units being in 180° phase relationship with each other,

linkage means for coupling said rotor units to each other, and

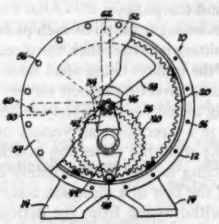
drive means for rotatably driving said rotor units.

4,096,763

HYPOCYCLOIDAL REDUCTION GEARING

Nathaniel B. Kell, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 22, 1976, Ser. No. 753,261
Int. Cl.[2] F16H *21/14*
U.S. Cl. 74—69 4 Claims



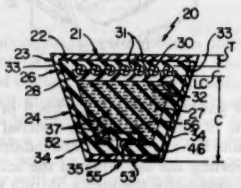
1. A speed reducing mechanism comprising; a housing; an output shaft rotatably supported in said housing; an input shaft rotatably supported in said housing; a gear carrier rotatably supported in said housing and being drivingly connected to said input shaft; an internally toothed gear; a pinion gear rotatably mounted on said gear carrier and meshing with said internally toothed gear and having at least one-half tooth more or less than one-half the number of teeth on said internally toothed gear; a plate member having first and second slots formed thereon in intersecting relation to each other with said intersection occurring at the central axis of said internally toothed gear; and first and second reaction means formed on said pinion gear and being disposed in said first and second slots; one of said internally toothed gear or said plate member being secured to said housing and the other being drivingly connected to said output shaft.

4,096,764

POWER TRANSMISSION BELT STRUCTURE AND METHOD OF MAKING SAME

Kenneth D. Richmond, Nixa; Russell E. Hartman, Springfield; Jerry W. Rogers, Springfield, and Jack Nelson, Springfield, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Mar. 30, 1977, Ser. No. 782,699
Int. Cl.[2] F16G *5/16*; B29H *7/22*
U.S. Cl. 74—233 20 Claims



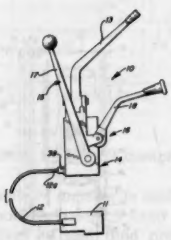
1. A power transmission belt structure having substantially its entire periphery covered by an outer fabric layer adjoined by an elastomeric layer, at least a portion of said elastomeric layer and fabric layer being the only structure defining a tension section of said belt structure.

4,096,765

CONTROL LINKAGE ARRANGEMENT

Thomas E. Cochran, Yorkville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 28, 1977, Ser. No. 772,802
Int. Cl.[2] G05G *11/00*
U.S. Cl. 74—473 R 27 Claims



1. In a vehicle drive having speed control means including a movable control element for causing the speed of the drive to vary in accordance with the positioning of said control element, and a manually operable speed lever mounted for selective positioning about mutually transverse first and second pivot axes, an improved connecting means interconnecting said speed lever and said control element for moving said control element as a function of pivotal movement of said speed lever, comprising:

a pivot member;

means for mounting said pivot member for pivoting about a third, fixed pivot axis intersecting said first pivot axis;

means connecting said pivot member to said control element to position said control element as a function of the pivotal position of said pivot member about said third pivot axis;

a ball connector;

a guide carried by said pivot member defining a channel spaced from said first pivot axis, said channel transversely intersecting said third pivot axis and slidably retaining said ball container; and

extensible means connecting said ball connector to said speed lever for mounting therewith about said first and second pivot axes, movement of said speed lever about said second pivot axis causing said extensible mounting means to move said ball connector in said guide channel from said third pivot axis to an operating position spaced from said third axis, and movement of said speed lever about said first pivot axis causing said extensible connecting means to move said ball connector disposed in said operating position arcuately about said third pivot axis to swing said control lever to an extent corresponding to the amount of pivoting of said speed lever about said first pivot axis.

4,096,766

SELF-CONTAINED MODULAR JOINT, NOTABLY FOR ROBOTS

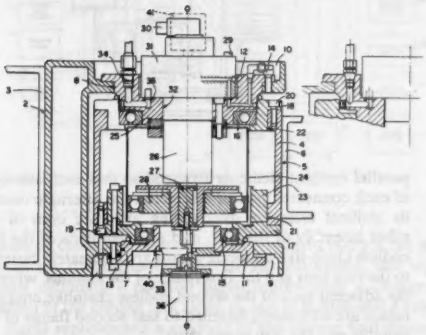
Pierre Pardo, and François Pruvot, both of Meudon la Foret, France, assignors to Sofermo, Meudon la Foret, France

Filed Jun. 11, 1976, Ser. No. 695,306

Claims priority, application France, Jun. 13, 1975, 75 18497

Int. Cl.[2] B25J *17/00*; A61F *1/04*; F16H *33/00*

U.S. Cl. 74—640 **5 Claims**



1. Self-contained modular joint adapted to interconnect two machine elements to permit a relative rotation of less than one revolution therebetween, wherein the first element comprises a strap consisting of a pair of wing-like extensions encompassing the second element in such a manner that said second element can pivot between said two wing extensions, each wing extension of said strap being provided with a bore concentric to the axis of said relative rotation, said bore being adapted to be engaged by first and second members of revolution each adapted to center and position in the axial direction an inner race of rolling contact bearings capable of absorbing axial and radial efforts, the outer race of each one of said bearings being carried by third and fourth members of revolution centered and secured to said second element so as to constitute between said two elements a joint free of both axial and radial play, wherein one of said third and fourth members of revolution secured to said second element has fitted thereon a toothed annulus of a reduction gearing assembly and wherein another element of said reduction gearing assembly comprises a flexible toothed ring which is secured to one of said first and second members of revolution rigid with the wing extension of said strap which is opposite said one of said third and fourth members of revolution rigid with said second element having said annulus secured thereto, said joint being further characterized in that said one of said first and second members of revolution also supports a control motor having a drive shaft mechanically connected to said reduction gearing assembly so as to drive said reduction gearing in such a manner that all the essential component elements of the joint are distributed along the axis of rotation about which one machine element can pivot in relation to the other element to an extent of less than one revolution.

4,096,767

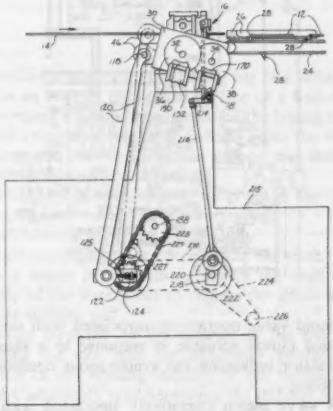
INDEXING AND INTERMITTENT DRIVE MECHANISM

Charles Luther Peters, Jr., Norco, Calif., assignor to Box Inards, Inc., Anaheim, Calif.

Filed Mar. 21, 1977, Ser. No. 779,804

Int. Cl.[2] B23Q *17/00*; F16H *27/02*

U.S. Cl. 74—822 **10 Claims**



1. In combination:

a housing;

a shaft extending through opposite walls of said housing, said shaft being adapted to be coupled at one end to apparatus to be intermittently operated;

a first bevel gear in said housing fixed to said shaft;

a pair of spaced bevel gear pinions on an axis at right angles to the axis of said shaft,

said pinions both being in mesh with said first bevel gear;

means supporting said pinions for angular movement in unison about said shaft;

means to reciprocally rotate said pinions about said shaft through a predetermined angle;

means to effect rotation of said first bevel gear and said shaft during angular movement of said pinions in one direction;

and means to prevent rotation of said first bevel gear and said shaft during angular movement of said pinions in the opposite direction.

4,096,768

HYDRO-MECHANICAL TRANSMISSION

Takayuki Miyao, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Oct. 3, 1975, Ser. No. 619,386

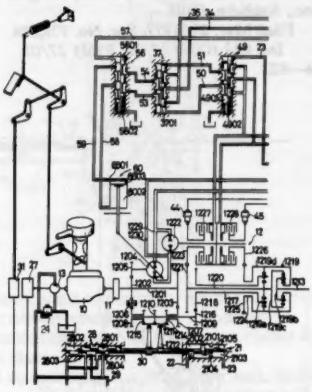
Claims priority, application Japan, Oct. 3, 1974, 49-114195

Int. Cl.[2] B60K *41/00*; F16H *47/04*

U.S. Cl. 74—865 **4 Claims**

1. In a hydro-mechanical transmission having an input shaft, an output shaft, a differential gear set including an input element connected to said input shaft and an output element

connected to said output shaft, a first positive displacement hydraulic pump-motor connected to said input shaft, a second hydraulic pump-motor connected to said first hydraulic pump-motor through a pair of conduits, a first clutch connected to said second hydraulic pump-motor for performing a low operational mode of a low speed ratio, and a second clutch connected to said second hydraulic pump-motor for performing a high operational mode of a high speed ratio, the operational modes thereof being switched-over when the rotational speed of said first clutch corresponds to or is synchronized with that of said second clutch an actuator connected to said first hydraulic pump-motor for varying the displacement ratio of said first hydraulic pump-motor, and a calculator operatively associated with said first and said second clutch the improvement which comprises:



a solenoid valve operatively associated with said first and second clutch actuable in response to a signal of said calculator indicating the synchronous condition of said clutches;

a first valve means operatively associated with and connected to said solenoid valve and actuable by a setting signal for increasing or decreasing the speed ratio of said transmission;

a second valve means connected to and actuable by said first valve means for supplying the hydraulic pressure selectively to said first clutch or said second clutch; and

a third valve means operatively connected with said actuator for controlling said actuator in response to the movement of said second valve means.

4,096,769

PLANETARY GEAR TYPE TRANSMISSION

Kazuhito Horikiri; Hiroshi Hirasawa, and Minoru Fujiwara, all of Okayama, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Continuation-in-part of Ser. No. 594,942, Jul. 11, 1975, abandoned. This application Apr. 22, 1976, Ser. No. 679,482

Int. Cl.[2] F16H *1/48*

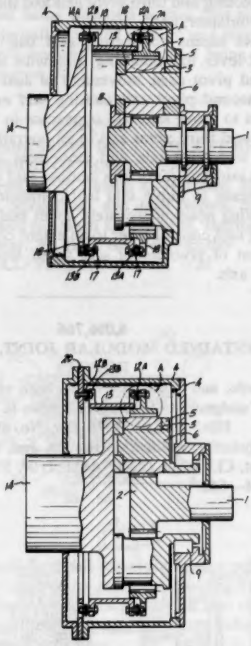
U.S. Cl. 74—801 **6 Claims**

1. A planetary gear type transmission comprising a sun gear formed integrally with a high-speed shaft, carrier arms secured to a casing, a plurality of planet gears which are rotatably supported on respective spindles provided on the carrier arms and which are meshed with the sun gear, a ring gear disposed in mesh with the planet gears, and a low-speed shaft in coaxial connection with the ring gear, wherein the improvement comprises:

an intermediate ring or annulus disposed coaxially with and between the ring gear and the low-speed shaft, the annulus being formed with a first flange facing the periphery of the ring gear and a second flange facing the low-speed shaft;

a first endless chain-like coupling means disposed between the ring gear and the first flange of the annulus; and

a second endless chain-like coupling means disposed between the second flange of the annulus and the low-speed shaft, each of the endless chain-like coupling means being composed of a plurality of lengthwise overlapped flat resilient link assemblies, adjacent ends of which are fixed together, each assembly consisting of a plurality of flat



parallel resilient elements arranged so that each assembly of each connected pair of assemblies has alternate ones of its resilient elements overlapping alternate ones of the other assembly of the pair, said adjacent ends of the first endless chain-like coupling means are alternately fastened to the ring gear and the first flange of the annulus, whereas the adjacent ends of the second endless chainlike coupling means are alternately fastened to said second flange of the annulus and the low-speed shaft.

4,096,770

METHOD AND APPARATUS FOR MODIFYING THE POSITION OF A MACHINE SLIDE TO COMPENSATE FOR DIFFERENT FOLLOWING ERRORS

Randall Curtis Tanner, Lebanon, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jun. 6, 1977, Ser. No. 803,566

Int. Cl.[2] B23B *1/00, 5/46*

U.S. Cl. 82—1 C **14 Claims**

1. A turning machine and a numerical control system of the type wherein a cutting tool initially contacts a rotating workpiece at the same angular position in response to a constant following error during successive machining passes, said numerical control responding to input signals for generating command signals to cause a servomechanism circuit to control the motion of the cutting tool relative to the workpiece, said input signals including a position signal representing a change of position of the cutting tool along an axis of motion and a velocity signal representing the velocity of the cutting tool during a machining pass, wherein the improvement comprises:

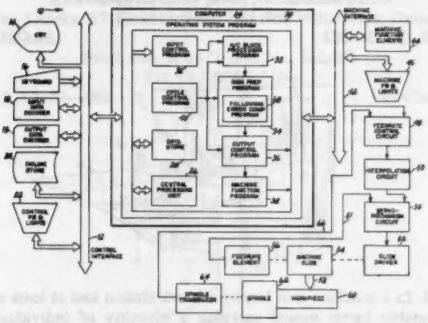
(a) means responsive to first position and velocity signals for generating first command signals to cause the servomechanism circuit to move the cutting tool through a first machining pass whereby the cutting tool initially contacts the workpiece at a first angular position of the workpiece;

(b) means responsive to the first velocity signal and a subsequent velocity signal for producing a compensation signal, said compensation signal representing a change in the following error caused by the difference between the first and subsequent velocity signals;

(c) means responsive to the compensation signal for generating second command signals to cause the servomechanism circuit to move the cutting tool through a displacement defined by the compensation signal; and

(d) means responsive to a subsequent position signal and the subsequent velocity signal for generating third command signals to cause the servomechanism circuit to move the cutting tool through a subsequent machining pass whereby the cutting tool initially contacts the rotating workpiece at the first angular position of the workpiece.

4. A method for use with a turning machine and numerical control system of the type wherein a cutting tool initially contacts a rotating workpiece at the same angular position in response to a constant following error during successive machining passes of the tool past the workpiece, said numerical control responding to input signals for generating command



signals to cause a servomechanism circuit to control the motion of the cutting tool relative to the workpiece, said input signals including a position signal representing a change of position of the cutting tool along an axis of motion and a velocity signal representing a velocity of the cutting tool during a machining pass, the improvement comprising the steps of:

(a) generating, in response to first position and velocity signals, first command signals to cause the servomechanism circuit to move the cutting tool through a first machining pass whereby the cutting tool initially contacts the workpiece at a first angular position of the workpiece;

(b) producing a compensation signal in response to the first and a subsequent velocity signal, said compensation signal representing a change in the following error corresponding to the difference between the first and subsequent velocity signals;

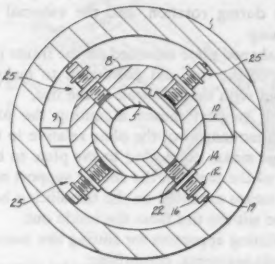
(c) generating, in response to the compensation signal, second command signals to cause the servomechanism circuit to move the cutting tool through a displacement defined by the compensation signal; and

(d) generating, in response to the subsequent velocity signal and a subsequent position signal, third command signals to cause the servomechanism circuit to move the cutting tool through a subsequent machining pass whereby the cutting tool initially contacts the rotating workpiece of the first angular position of the workpiece.

4,096,771
ADJUSTABLE AND FLOATING BORING BAR STABILIZER

David Jan Monro, Milford, Conn., assignor to USM Corporation, Farmington, Conn.

Filed Oct. 8, 1976, Ser. No. 730,746
Int. Cl.[2] B23B *29/02, 29/14*
U.S. Cl. 82—35 2 Claims



1. A device for stabilizing the boring bar of a lathe adapted to machine an interior cylindrical surface of a hollow workpiece comprising a tool head mounted on the boring bar and a plurality of assemblies extending radially from the tool head for engaging said interior surface to support and stabilize the boring bar, each assembly including:

A. a cylindrical housing slidably received in the tool head for adjustment radially of the boring bar,

B. a shaft slidable axially in the housing,

C. a guide mounted on the outer end of the shaft,

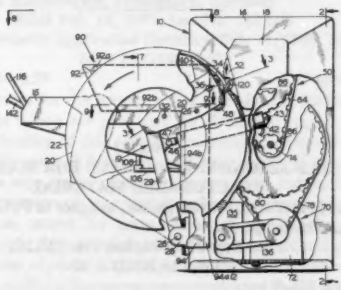
D. spring means in the housing urging the shaft outward radially of the boring bar to engage the guide with said interior surface, and

E. a flange threaded on the exterior of the housing and engaging the tool head for adjustably determining the location of the housing radially of the boring bar and thereby adjustably predetermining the resilient stabilizing forces acting against said interior surface.

4,096,772
TIRE SLITTING APPARATUS

Walter Dennis Hall, 13729 NE. Klickitat, Portland, Oreg. 97230; Merrell Thomas Miller, 13707 NE. Marine Dr., Portland, Oreg. 97211, and Douglas L. Roof, 3117 NE. 33rd Ave., Portland, Oreg. 97212

Filed Sep. 26, 1975, Ser. No. 617,060
Int. Cl.[2] B23B *3/04*
U.S. Cl. 82—82 6 Claims



1. A tire slitting apparatus for slitting tire carcasses circumferentially into segments, comprising:

a. a frame,

b. a tire head assembly mounted on the frame and receiving the tire,
c. a tire slitting head mounted on the tire head assembly and fitting inside the body of the tire engaging the inner crown thereof,
d. tire drive means engaging the outer crown of the tire and operative to rotate the tire around the tire slitting head,
e. external guide means mounted on the frame and positionable against the side wall of the tire to guide and stabilize the tire during rotation, and the external guide means comprising:
1. an L-shaped plate mounted on the frame parallel to the plane of the tire and positioned to make three point contact with the side wall of the tire,
2. sliding support means mounting the plate to allow lateral movement of the plate relative to the tire, and
3. linkage means connected to the plate to initiate movement of the plate on the sliding support means, and
f. cutting means mounted on the tire slitting head and positioned to slit the tire from the inside out.

3. A tire slitting apparatus for slitting tire carcasses circumferentially into segments, comprising:
a. a frame,
b. a tire head assembly mounted on the frame and receiving the tire,
c. a tire slitting head mounted on the tire head assembly and fitting inside the body of the tire engaging the inner crown thereof,
d. tire drive means engaging the outer crown of the tire and operative to rotate the tire around the tire slitting head, the tire drive means comprising:
1. drive rollers rotatably mounted in the frame and positioned to frictionally engage the outer crown surface of the tire,
2. elastic bands defining a plurality of peripheral holes and configured to fit releasably over the drive rollers for frictional engagement therewith,
3. tire studs located within the holes and having head portions positioned between the bands and the drive rollers and gripping portions protruding from the bands, and
4. power means for rotating the drive rollers,
e. external guide means mounted on the frame and positionable against the side wall of the tire to guide and stabilize the tire during rotation, and
f. cutting means mounted on the tire slitting head and positioned to slit the tire from the inside out.

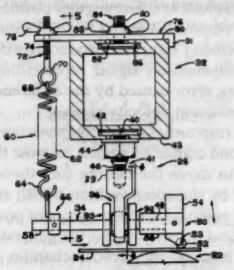
4,096,773

SELF-ALIGNING APPARATUS FOR SCORING FRACTURABLE MATERIAL

Robert P. DeTorre, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 22, 1976, Ser. No. 725,222
Int. Cl.[2] B26D *3/08*
U.S. Cl. 83—8 **16 Claims**

1. An apparatus for scoring a fracturable material, comprising:
an elongated member having a first section and a second section;
a rod end ball joint mounting said member between the first and second sections;
scoring means mounting the first section of said member; and



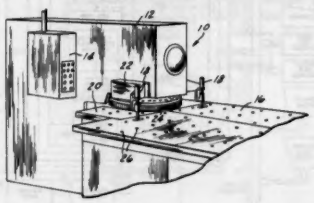
biasing means acting on said elongated member to urge said scoring means under a predetermined scoring force toward the fracturable material to be scored.

4,096,774

TURRET PUNCHES

Harold Kaufmann, Rochester, Minn., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,474
Int. Cl.[2] B26F *1/14*
U.S. Cl. 83—552 **14 Claims**



1. In a machine tool having a work station and at least one rotatable turret means carrying a plurality of individually utilized tools, the improvement of said turret means having a support portion, a plurality of individual tool holding members supported by said support portion, coupling means retaining said tool holding members in a relatively fixed position with respect to the support portion and the turret means for rotation with the turret means, at least some of said tool holding members receiving and accurately positioning with respect to the tool holding member a plurality of individual tools, means for assuring precise positioning of one of the tool holding members with respect to the work station when a given tool of the one tool holding member is positioned at the work station and said means for assuring positioning including reciprocatable means acting on the one of the tool holding members for assuring said precise positioning of the one of the tool holding members.

4,096,775

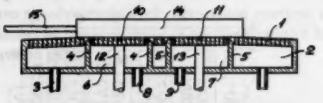
METHOD OF CUTTING WRAPPERS FOR TOBACCO PRODUCTS AND CUTTING TABLE FOR CARRYING OUT SAID METHOD

Jorgen Thyrsted Thomsen, Fredericia, Denmark, assignor to J. P. Schmidt Jun. A/S, Fredericia, Denmark

Filed Feb. 2, 1977, Ser. No. 764,873
Claims priority, application Denmark, Feb. 5, 1976, 481/76
Int. Cl.[2] B26D *1/02*
U.S. Cl. 83—511 **3 Claims**

1. A cutting device for cutting wrappers for cigars, cigarillos or cheroots from tobacco leaves, said device including a cutting table, a plurality of cutting knives having cutting edges

adjacent said table, said cutting edges of each of said knives defining a contoured shape desired for a wrapper with an acute lobe at one end thereof, said table and said knives being movable relative to one another to position said edges in a first position withdrawn from said table, said table and said knives being operable to position said knives in said first position



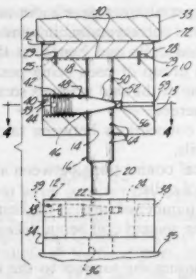
independently of one another, pressure means movable relative to said table and knives and cooperable with said knife edges when said knives are in said first position to cut tobacco leaves, said knives being positioned relative to one another so that consecutive operations can be performed on a tobacco leaf after displacement of said leaf while maintaining the same orientation of the stem of the leaf.

4,096,776

RETAINER FOR PUNCH AND DIE SETS

Ivan Laucke, 17 Farmstead Rd., #1601, Willowdale, Ontario, Canada

Filed Aug. 8, 1977, Ser. No. 822,420
Int. Cl.² B26F *1/14*
U.S. Cl. 83—698 **13 Claims**



5. A punch or die retainer arrangement for securing a tool within a bore formed in a tool holder body structure, the tool retainer arrangement comprising:

a pin retainer having a conically tapered portion, a straight-sided portion integral with said tapered portion and a threaded portion integral with said straight-sided portion opposite said tapered portion, said pin retainer disposed within a retainer seat formed in said holder body extending transversely to said bore in said holder body, said retainer seat having a threaded portion engaging said threaded portion on said taper pin retainer, a tapered portion complementary to said taper portion on said taper pin retainer, and partially intersecting said bore in said holder body, and an intermediate straight-sided portion between said threaded and tapered portion adapted to receive said straight-sided portion of said pin retainer; and,

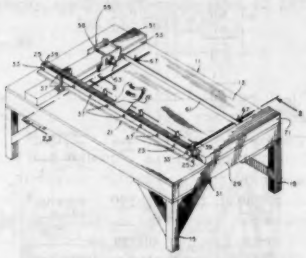
a partially conical taper groove formed on said tool and complementarily shaped to said tapering portions of said pin retainer and said retainer seats to be engaged by said pin retainer taper portion as said taper pin retainer is advanced into said retainer seat by said threaded engagement.

4,096,777

HAND POWER TABLE SAW

Charles Lee Adams, Rte. 6, Fayetteville, Ark. 72701

Filed Dec. 9, 1976, Ser. No. 749,111
Int. Cl.² B23D *49/10*
U.S. Cl. 83—762 **17 Claims**



10. Hand power table saw apparatus comprising

a handsaw with a semi-rigid blade,

substantially flat sheet material forming a horizontal work surface,

support means for supporting such sheet material above floor level,

said sheet material being formed with a straight slot therethrough with a width at least slightly greater than the thickness of said handsaw blade and of a length at least about twice the width of said handsaw blade,

a saw guide structure including two rigid, parallel members spaced apart to form an opening of a width greater than the thickness of said handsaw blade and a length at least about twice the width of said handsaw blade,

means fixedly supporting such structure at least about one-half inch to two inches above the upper surface of said sheet material to form an unobstructed passage for a handsaw blade between said parallel members and through said slot, and

means for fully restraining a workpiece being sawed, said means including at least one adjustable clamp device on said saw guide structure acting to clamp a workpiece downwardly on said work surface and a work guide fixed on said surface at a predetermined angle to said parallel members.

4,096,778

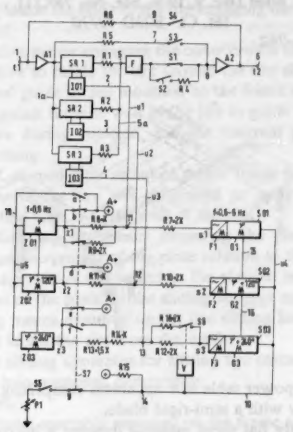
APPARATUS FOR PROCESSING TONE SIGNALS

Wilfried Dittmar, Halsenbach, Germany, assignor to WERSI-electronic GmbH & Co. Kommanditgesellschaft fur elektronische Bauelemente, Halsenbach, Germany

Filed Feb. 14, 1977, Ser. No. 768,546
Claims priority, application Germany, Feb. 21, 1976, 2607136
Int. Cl.² G10H *1/02*
U.S. Cl. 84—1.25 **23 Claims**

1. Apparatus for the processing of tone signals, particularly tone signals which are produced by electronic organs, comprising a plurality of delay circuits including a first and a second delay circuit each having a multi-stage analog shift register including a tone signal receiving input and an output for delayed transmission of tone signals, a low-frequency oscillator including an output for transmission of variable-frequency control signals, the control signals at the outputs of said oscillators being out of phase with respect to each other, and a high-frequency oscillator having an input connected to the output of the respective low-frequency oscillator and output means for transmission of variable-frequency tone signal transporting pulses to the respective shift register whereby the frequency of said pulses and the intervals of transport of tone signals

through said shift registers vary as a function of variations of amplitude of the respective control signals; and means for



respectively connecting the inputs and outputs of said shift registers to each other.

4,096,779

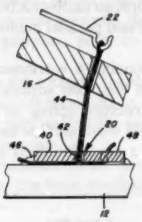
STRING ANCHOR REPLACEMENT FOR REPETITION LEVER AND JACK IN A PIANO ACTION

Ernest Vagias, 265 Prospect St., Baden, Pa. 15005

Filed Jan. 7, 1977, Ser. No. 757,764

Int. Cl.[2] G10C *3/22*

U.S. Cl. 84—239 **9 Claims**



1. In a piano action of the type including a wippen having a support pedestal extending from the upper surface of said wippen, a repetition lever pivotally connected to said support pedestal, a jack pivotally connected at one end of the wippen to extend into an opening in an end of the repetition lever, a spring having one end connected to said repetition lever and a free end overlying a second opening through said repetition lever to urge a regulation button mounted at the end of the repetition lever which is opposite the jack toward a contact area on said upper surface of said wippen, the improvement comprising, in combination, an anchor plate adhered onto the upper surface of said wippen between said support pedestal and the contact area, said anchor plate having a string opening therethrough at a generally underlying location beneath said second opening in the repetition lever, and a string having end portions anchored between said wippen and said anchor plate while (a) an intermediate looped portion extends through the string opening in said anchor plate, the looped portion of the string having a sufficient length to extend through said second opening in the repetition lever for connection with said spring.

4,096,780

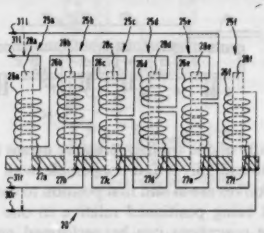
STEREOPHONIC ELECTROMAGNETIC PICKUP DEVICE FOR STRINGED MUSICAL INSTRUMENTS

Lorna Ann Dawson, 12 Grove Rd., Pinner, Middlesex, England

Filed Dec. 23, 1976, Ser. No. 753,734

Int. Cl.[2] G10H *3/08*

U.S. Cl. 84—1.16 **10 Claims**



1. A polyphonic pickup device for use with a stringed musical instrument of a type having an instrument body, a plurality of strings of ferromagnetic material, means for suspending said strings under tension from two spaced portions of the instrument body and means for individually adjusting the tension in each string so as to adjust the musical pitch of that string, the pick-up device comprising:

a support;

a plurality of groups of electric coils mounted to the support, the number of groups of said coils corresponding to the number of strings of the musical instrument, each group of coils being spaced apart from the other groups of coils, several of said groups having at least first and second coils;

a plurality of spaced-apart permanent magnets mounted to the support and corresponding in number to the number of groups of said coils and hence to the number of said strings; each group of coils being positioned close to an associated one of the said magnets so as to be in the magnetic field thereof;

first electrical connections between said first coils of said groups of coils;

second electrical connections between said second coils of said groups of coils;

the ratio of the number of turns in the first coil to the number of turns in the second coil being different for each group of coils;

means for mounting the support to the instrument body to place each string in the magnetic field of a respective one of the said magnets;

means for producing as a first electrical output signal a combination of electric signals from said first coils resulting from vibration of said strings;

and means for producing as a second electrical output signal a combination of electric signals from said second coils resulting from vibration of said strings;

whereby polyphonic reproduction of said first and second electrical output signals produces an aural effect as if the individual strings of the musical instrument are widely spaced apart.

4,096,781

PROCESS AND MACHINE FOR PRODUCTION OF BRAIDED PACKING

Kurt Bock, Estebogen 49, 2151 Hamburg Cranz, and Georg Flohr, Margarethenstr. 25, 2110 Buchholz, both of Germany

Division of Ser. No. 503,435, Sep. 5, 1974, abandoned. This application Dec. 10, 1975, Ser. No. 639,410

Int. Cl.[2] D04C *3/08*

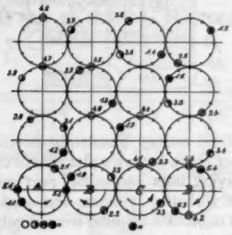
U.S. Cl. 87—28 **8 Claims**

1. In a braiding process of the type adapted to insert an additive thread along a fabric surface and including revolution

of a plurality of base material containing bobbins about a base material bobbin path, the improvement comprising:

(a) guiding at least one bobbin containing additive thread around said base material bobbins whenever the latter pass through a portion of said base material bobbin path corresponding to said fabric surface; and

(b) providing stationary switch means along said base material bobbin path portion so that said additive material bobbins revolve exclusively about said portion, while said base material bobbins revolve about the entire base material bobbin path.



3. In a braiding apparatus of the type including a bobbin path, base material containing bobbins, and means for rotating said bobbins about said bobbin path to form a braided fabric, the improvement comprising:

(a) additive yarn containing bobbins disposed in said bobbin path;

(b) means for driving said additive yarn containing bobbins along said bobbin path; and

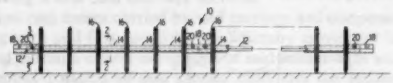
(c) stationary switch means disposed along said path for limiting movement of said additive yarn containing bobbins to a certain bobbin path portion so that said additive yarn extends only along a certain fabric surface.

4,096,782

BARRIER FOR WHEELED VEHICLES

Pierre J. Deschenes, Shrivenham, Nr. Swindon, England, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed May 28, 1976, Ser. No. 689,173
Claims priority, application Canada, May 29, 1975, 228002
Int. Cl.[2] F41H *11/08*
U.S. Cl. 89—1 A 5 Claims



1. A barrier adapted to check passage of pneumatically tired vehicles comprising, in combination,

an elongated rod,

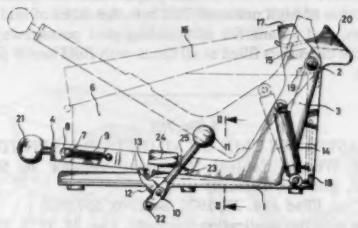
a plurality of substantially planar cutters each having an aperture therethrough to enable the cutter to be mounted on the rod, each cutter having at least two elongated cutting edges oriented to engage a support surface and to project into the path of vehicle tires, each cutter comprising two similar elongated plates, each plate having a profile defining a central portion and two diametrically opposed cutting tips extending outwardly of the central portion; said two plates being secured together with the length dimensions at right angles to one another and spacer means for spacing said cutters along said rod.

4,096,783

MOUNTING FOR AMMUNITION CONTAINERS ON RAPID-FIRE GUN MOUNTS

Erich Wallwey; Wolfgang Becker, both of Vellmar, and Heinrich Heldmann, Kassel, all of Germany, assignors to Wegmann & Co., Kassel, Germany

Filed Dec. 6, 1976, Ser. No. 747,587
Claims priority, application Germany, Dec. 12, 1975, 2555126
Int. Cl.[2] F41F *9/06*
U.S. Cl. 89—34 10 Claims



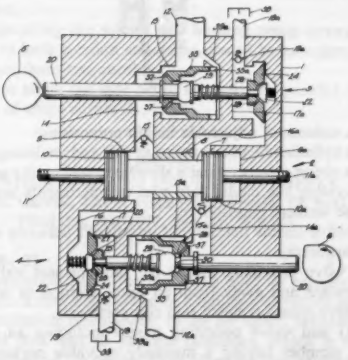
1. A mounting for an ammunition container for mounted rapid-fire weapons comprising a yoke disposed on a bracket, said yoke pivotable about a horizontal axis disposed at about the level of the upper edge of an ammunition container to be contained therein, said yoke being secured at its lowermost position by a catch means and consisting of a pair of laterally running, parallel arms joined by a transverse member.

4,096,784

HYDRAULIC POWER SYSTEM

Theodore Ongaro, c/o Ongaro Dynamics Ltd., 939 King Ave., Columbus, Ohio 43212

Filed Sep. 7, 1976, Ser. No. 720,562
Int. Cl.[2] F01B *25/02*
U.S. Cl. 91—6 23 Claims



1. An hydraulic power system comprising a housing, a piston reciprocally mounted in said housing, said piston having an opposing pair of piston heads defining with said housing a first and a second piston chamber, at least one piston rod connected to said piston for movement thereby, fluid delivery passageways and fluid discharge passageways in communication with said piston chambers, a first and a second control valve for sequentially introducing fluid under high pressure into said piston chambers, said control valves each having a valve stem mounting a high pressure valve member and a pressure relief valve member, said valve members being movable by said valve stems from closed to opened positions and return upon actuation of said valve stems, the high pressure valve member of the first control valve being connected to the fluid delivery

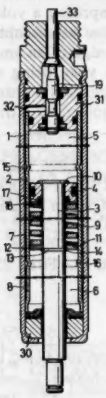
passageway of the first of said piston chambers, the pressure relief valve member of said first control valve being connected to the fluid discharge passageway of the second of said piston chambers, the high pressure valve member of the second control valve being connected to the fluid delivery passageway of the second of said piston chambers, and the pressure relief valve member of said second control valve being connected to the fluid discharge passageway of the first piston chamber, means for sequentially actuating said valve stems to open and close the valve members of said control valves so as to relieve high pressure fluid in one of said piston chambers prior to the introduction of high pressure fluid into the other of said piston chambers, and means for maintaining said passageways and said piston chambers filled at all times with fluid under positive pressure.

4,096,785

ELASTIC COLUMN OF ADJUSTABLE LENGTH

Winfried Wirges, Koblenz, Germany, assignor to Stabilus GmbH, Koblenz, Germany

Filed Jun. 21, 1976, Ser. No. 697,980
Claims priority, application Germany, Jun. 28, 1975, 2528980
Int. Cl.[2] F15B *15/17*; F16J *1/10*
U.S. Cl. 91—416 **15 Claims**



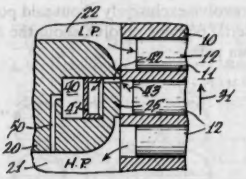
1. A column of adjustable height comprising:
(a) a cylinder member having an axis and enclosing a cavity;
(b) a piston member axially slidable in said cavity and axially dividing the cavity into two compartments sealed from the ambient atmosphere;
(c) valve means operatively interposed between said compartments;
(d) valve operating means for moving said valve means toward and away from an open position in which said valve means connect said compartments,
(1) said valve operating means including an operating member having a manually movable portion outside said cavity in said atmosphere,
(2) said operating member being connected to said valve means for moving the same when said portion of the operating member is moved.
(3) said valve means sealing said compartments from each other when away from said open position;
(e) a piston rod member secured to said piston member for relative axial movement and extending axially outward of said cavity in movable, sealing engagement with said cylinder member;
(f) a fluid under a pressure higher than atmospheric pressure filling said compartments; and
(g) yieldably resilient means abuttingly interposed between said piston member and said piston rod member for impeding said relative movement.

4,096,786

ROTARY FLUID ENERGY TRANSLATING DEVICE

George A. Schauer, Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 19, 1977, Ser. No. 798,603
Int. Cl.[2] F01B *13/04*
U.S. Cl. 91—499 **26 Claims**



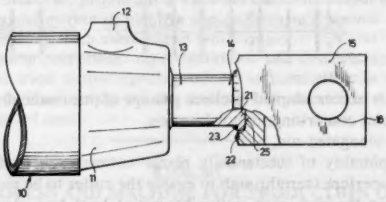
1. A rotary fluid energy translating device comprising, a rotatable cylinder block having a plurality of cylinders therein, valve means having inlet and outlet port means adapted to serially connect with the cylinders and a pair of cross-over areas positioned to block a cylinder from simultaneous communication with the inlet and outlet port means, each of said cylinders having a movable member with the members of the cylinders adjacent one cross-over area positioned to provide small fluid volume in the associated cylinders and the members of the cylinders adjacent the other cross-over area positioned to provide large fluid volume in the associated cylinders, a trapped fluid chamber in each of said cross-over areas having a flow passage positioned to communicate with a cylinder prior to a cylinder communicating with one of the port means in order to reduce the rate of pressure change when a cylinder subsequently communicates with one of said port means, movable means in each chamber to vary the volume of said chamber, and means for controlling said movable means to have a small volume chamber when an adjacent cylinder has a small fluid volume and to have a large volume chamber when an adjacent cylinder has a large fluid volume.

4,096,787

CYLINDER-AND-PISTON ARRANGEMENT AND METHOD OF MANUFACTURING THE SAME

Hartmut Sandau, Möglingen; Wilhelm Weigert, Schwieberdingen; Winfried Steinel, Königsfeld; August Kraisel, Bittenfeld; Klaus Ritter, Stuttgart; Erwin Gaub, Zweibrücken, and Heinrich Kochendörfer, Rommelshausen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 8, 1976, Ser. No. 730,713
Claims priority, application Germany, Dec. 5, 1975, 2554748
Int. Cl.[2] B23P *15/10*; F16J *1/12*
U.S. Cl. 92—260 **11 Claims**



1. A method of forming a fork-shaped member and of connecting the same to one end of a piston rod projecting outwardly of a cylinder and connected at the other end with a piston, comprising the steps of bending without twisting a flat steel strip into a fork-shaped member having a base portion and a pair of parallel leg portions projecting parallel to each other and substantially normal to the base portion from opposite ends of the latter to one side thereof; forming in said base portion

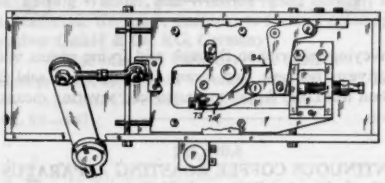
midway between said opposite ends a substantially circular depression extending from the other side of the base portion into the latter and having a planar end face; abutting said one end of said piston rod against said planar end face; and friction welding said one end of said piston rod to said end face to fixedly connect said fork-shaped member to said piston rod.

4,096,788

APPARATUS FOR FORMING A CONTAINER SIDE WALL

Jerry W. Young, Weston, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1977, Ser. No. 798,048
Int. Cl.² B31B *1/32*
U.S. Cl. 93—39 L **7 Claims**



1. An apparatus for making a container by wrapping a blank around a mandrel to form a tubular side wall for a container, said apparatus including:

(a) a mandrel;

(b) clamp means cooperating with said mandrel for holding a portion of a blank in engagement with said mandrel;

(c) first and second wing means positioned for contact with an outer disposed surface of the held blank on opposite sides of the clamp means;

(d) first means operably connected to said first and second wing means for rotating said first and second wing means about the axis of the mandrel for wrapping the held blank around the mandrel and for terminating rotation of the first wing means around the axis before opposite side margins of the blank are overlapped by continuing rotation of the second wing means around the axis, said first means including:

(1) a carriage;

(2) guide means for movably supporting said carriage;

(3) drive means operably connected to said carriage for effecting reciprocating movement thereof in forward and retractive directions;

(4) first and second shaft means each carrying one of said first and second wing means, respectively;

(5) first and second arms each connected to one of said first and second shafts, respectively, said second arm having a first cam follower thereon;

(6) first cam means carried by said carriage and cooperating with said first cam follower whereby movement of said carriage effects movement of said second arm and thereby rotation of said second shaft and the second wing means;

(7) a third arm pivotally mounted on said carriage and movable therewith;

(8) a linkage means operably connecting said third arm to said first arm whereby movement of said carriage effects movement of said first arm and thereby rotation of said first shaft and the first wing means; and

(9) stop means cooperating with said first arm for substantially stopping movement thereof during forward movement of said carriage and thereby substantially stopping movement of the first wing means;

(10) second means cooperating with said third arm for selectively preventing pivotal movement thereof until said carriage nears the end of the forward movement whereby upon pivotal movement of said third arm said carriage can continue forward movement after said first arm has stopped moving to effect further movement of said second arm and said second wing means; and

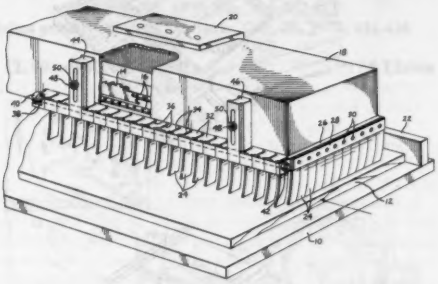
(e) third means operable for urging the overlapped side margins into engagement with one another and effect securing same together to form a tubular side wall.

4,096,789

SAW GUARD

James Edward Blessinger, Jasper, Ind., assignor to Kimball International, Inc., Jasper, Ind.

Filed Apr. 6, 1977, Ser. No. 785,066
Int. Cl.² B27G *19/00*
U.S. Cl. 83—478 **7 Claims**



1. A splinter shield for a saw blade associated with a work supporting table comprising:

a downwardly opening housing adapted to be mounted above the saw blade and having a front and a side,

a plurality of flexible strips depending from the front and side of said housing, said strips being substantially wider than they are thick,

said strips across the front of said housing being arranged in edge to edge relation so that they are substantially coplanar with adjacent strips being in close proximity to one another,

said strips along the side of said housing being arranged in front to back relation and being spaced by an appreciable distance from one another,

said strips along the side being substantially parallel to the plane of strips across the front.

4,096,790

VENTILATION AND INSULATION BAFFLE

Laurence E. Curran, 460 E. High Point, Peoria, Ill. 61614

Filed Jun. 24, 1977, Ser. No. 809,528
Int. Cl.² F24F *7/00*
U.S. Cl. 98—37 **2 Claims**

1. An insulation baffle for mounting over an exterior wall and between a roof and ceiling of a building structure to provide a ventilation passageway to an air space between the ceiling and roof and to prevent insulation which is subsequently applied to the ceiling from clogging said passageway, in which the exterior wall has a sill on which ceiling joists and inclined parallel roof rafters are supported, said rafters being spaced from each other a predetermined distance, said insulation baffle comprising:

a formed sheeting of substantially moisture impervious material, said sheeting including upper and lower surfaces, opposed side edges, and opposed end edges;

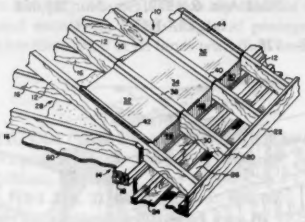
the width of said sheeting between the side edges thereof being generally a multiple of the predetermined distance between adjacent rafters;

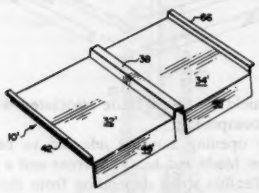
said opposed side edges being laterally upwardly offset relative to the upper surface of the sheeting and defining predetermined height rafter overlying downwardly opening edge channel portions, each edge channel portion conforming to and being engageable with a substantial

portion of the width of a rafter along the upper edge of the rafter for the full length of the side edge of the sheeting;

at least one integral intermediate upwardly offset downwardly opening rafter overlying channel defined across said sheeting parallel to and of equal height with the opposed side edge channel portions and spaced relative thereto, said intermediate channel conforming to and being engageable over the full width of a rafter along the upper edge of the rafter;

the sheeting between the edge channel portions and the





intermediate channel forming planar panels of a width generally equal to the predetermined distance between adjacent rafters for engagement therebetween upon positioning of the edge channel portions and intermediate channel over adjacent rafters;

each of said planar panels having an integral full length extension along one end edge thereof, said extensions extending laterally downward from the lower surface of the sheeting for engagement with the sill between adjacent rafters whereby to block the movement of insulation particles from the interior of the structure past the sill.

4,096,791

APPARATUS FOR MAKING A FRIED FORMED CHIP

Verne E. Weiss, Wayzata; Glenn M. Campbell, and Gerald L. Wilson, both of Minneapolis, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Division of Ser. No. 355,260, Apr. 27, 1973, Pat. No. 3,935,322.
This application May 21, 1975, Ser. No. 579,748
Int. Cl.[2] A47J *37/12*
U.S. Cl. 99—353 **7 Claims**

1. Apparatus for making chip type snack products from a farinaceous dough, said apparatus comprising:

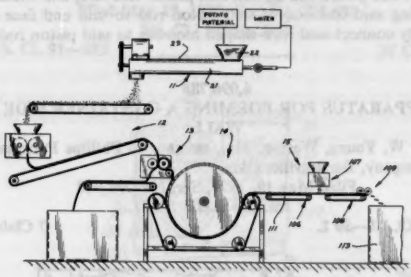
(a) first forming means comprising a pair of rolls for forming said dough into a continuous sheet;

(b) second forming means for forming and cutting said sheet into a continuous ribbon having alternative wide and narrow portions, said alternating wide and narrow portions defining a series of uniformly-shaped chip preforms;

(c) frying means for frying said continuous ribbon of dough including means for constraining said ribbon in a uniform shape while frying said ribbon;

(d) severing means for severing said fried ribbon at said narrow portions, thereby providing a plurality of uniformly-shaped fried chips; and

(e) conveying means, including means for conveying said dough from said first forming means to said second forming means, means for conveying said ribbon from said second forming means to said frying means, means for



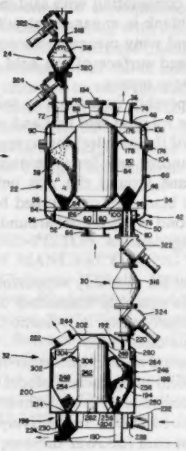
conveying said ribbon through said frying means with a positive movement, and means for conveying said fried ribbon from said frying means to said severing means.

4,096,792

CONTINUOUS COFFEE ROASTING APPARATUS

Horace L. Smith, Jr., Richmond, Va., assignor to Smitherm Industries, Inc., Richmond, Va.

Filed Nov. 5, 1975, Ser. No. 628,915
Int. Cl.[2] A23F *1/02*; A23N *9/02*
U.S. Cl. 99—355 **16 Claims**



1. Apparatus for roasting coffee and the like which comprises: first and second reactors, each of which includes a shell, means in said shell comprising a movable assembly for supporting the beans to be processed therein, means for rotating the movable assembly about a vertical axis to thereby displace the beans in the reactor from a first location in said reactor to a second location therein, an inlet means above the movable assembly through which beans can be charged into said assembly, and deflector means for keeping beans from falling between the movable assembly and the reactor shell, said movable assembly having an outer wall means which includes a first member and a second member spaced inwardly from and extending above the first member and said deflector means extending inwardly from said shell to said outer wall means to direct beans falling outside the movable assembly through the gap between the first and second members of the outer wall means into the interior of the movable assembly; means for introducing coffee beans into said first reactor at one location; means for roasting said beans as they are displaced from the

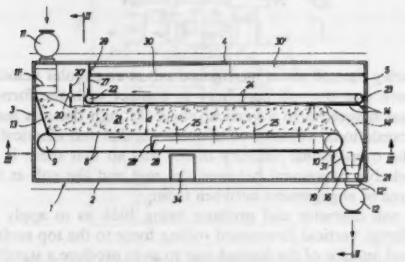
first to the second of said locations in said first reactor by so effecting a flow of roasting fluid upwardly through the first reactor that the beans circulate into intimate and uniform contact with the roasting fluid; means for discharging roasted beans from the first reactor at said second location and into the second reactor at the first location therein; means for cooling the roasted beans as they are displaced from the first location to the second location in said second reactor by so effecting a flow of fluid upwardly through the second reactor that the roasted beans circulate into intimate and uniform contact with the fluid; and means for discharging cooled beans from the second reactor at the second location therein.

4,096,793

APPARATUS FOR COOLING HOPS

Rudolf Ludwig Wachter, and Winfried Franz Edinger, both of Au, Hallertau, Germany, assignors to Firma Permahop Hopfenpulver GmbH & Co. KG, Germany

Filed Mar. 25, 1976, Ser. No. 670,289
Claims priority, application Germany, Mar. 27, 1975, 2513884
Int. Cl.[2] A23L *3/36;* B60H *3/04*
U.S. Cl. 99—467 8 Claims



1. Apparatus, for continuously cooling hops, comprising:

(i) a cooling chamber having an inlet opening adjacent to a first endwall thereof and an outlet opening adjacent to a second endwall thereof

(ii) an air lock charging means disposed at said first endwall of said chamber substantially centrally of one end of the chamber roof for charging hops into said chamber, said airlock charging means having a closure openable under the weight of hops accumulated thereon

(iii) an air lock discharging means disposed at said second endwall in the bottom of said chamber for discharging cooled hops therefrom and having a closure openable under the weight of hops accumulated thereon

(iv) a rotatable hop-distributing roller disposed in said cooling chamber adjacent to said charging means and above said conveyor belt, said roller extending transversely to the direction of conveying movement of said conveyor belt, said roller being adapted to shift hops axially for distributing charged hops evenly on said conveyor belt

(v) a driven gas-permeable mesh screen endless conveyor belt, having openings slightly smaller than lupulin granules, disposed substantially horizontally in said cooling chamber and extending substantially from said first endwall to said air lock discharging means and having a portion disposed to receive hops from said charging means to form a bed of hops on said conveyor belt

(vi) a second driven endless belt, having openings smaller than lupulin granules, disposed in said cooling chamber above said conveyor belt and parallel thereto and extending substantially from said air lock charging means to said second endwall for engaging said hops thereon to maintain said bed of hops at a predetermined height on said conveyor belt

(vii) means in said cooling chamber for directing a flow of cooling gas through said bed of hops on said conveyor belt, and for collecting said cooling gas after passage through said bed of hops, and

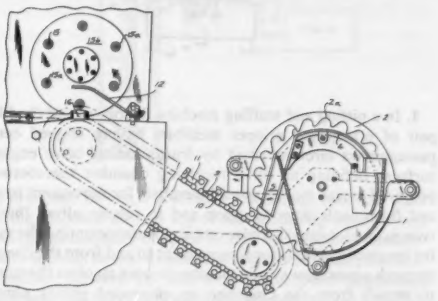
(viii) means for receiving said collected gas, re-cooling it, and passing it to said gas directing means.

4,096,794

OLIVE PITTER AND STUFFER

Clemente del Ser González, Villaverde Alto Paseo de Talleres No. 5, Madrid, Spain

Filed Apr. 15, 1975, Ser. No. 567,811
Claims priority, application Spain, Oct. 28, 1974, 431.436
Int. Cl.[2] A23N *4/08*
U.S. Cl. 99—494 6 Claims



1. An olive pitting and stuffing machine comprising hopper means for receiving olives to be pitted;

a pair of olive selection disks rotatable in spaced-apart relation in said hopper means to entrain successive olives thereon;

respective olive-conveying chains assigned to each of said disks and receiving olives in succession therefrom, each of said chains carrying its olives in succession to a respective pitting station;

a pair of turntables in space-apart relationship provided with a set of axially displaceable pitting plungers individually successively positionable at the respective pitting stations in alignment with successive respective olives and being movable successively to respective stuffing stations by rotation of their respective turntables;

a respective olive coring device disposed at each of said pitting stations opposite the respective turntable from its plunger and provided with a tubular knife for cutting an opening in the respective olive for ejection of the pit therethrough by the respective plunger;

a common mechanism for rotating said turntables and axially displacing said plungers to eject the pits at the pitting stations and to impale the olives thereon, to transport the olives to the stuffing stations and ultimately to retract from the olives at their respective stuffing stations;

respective stuffing devices disposed at the stuffing stations opposite each of said turntables from said plungers and each including retainers for retaining successive olives carried by the plungers in an open condition by engagement therewith;

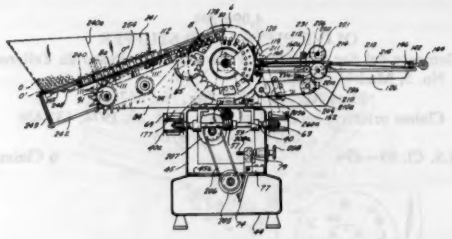
means for inserting stuffing through the retainers in the openings of the respective olives at the stuffing stations; and

a common operating mechanism for synchronously operating both said selection disks, chains, sets of plungers, coring devices, rotating means, retainers, and stuffing devices.

4,096,795
OLIVE PITTING AND STUFFING MACHINE

Clemente Del Ser Gonzalez, Po.de Talleres 36, Villaverde Alto (Madrid), Spain

Continuation-in-part of Ser. No. 701,942, Jul. 1, 1976, abandoned. This application Aug. 6, 1976, Ser. No. 712,320
Claims priority, application Spain, Feb. 3, 1976, 444888
Int. Cl.[2] A23N 4/08
U.S. Cl. 99—494 8 Claims



1. In a pitting and stuffing machine for olives and the like, a pair of juxtaposed gripper members having aligned central passageways circumscribed by frusto-conical olive engaging surfaces defining an olive receiving chamber therebetween; powered means mounting said members for movement toward and from each other to grasp and to release olives therebetween; an elongated tubular cutter; means mounting the cutter for longitudinal reciprocal movement to and from the chamber through a passageway of a member to core an olive therein and to retract from the chamber; an elongated pitting plunger; means mounting the pitting plunger for reciprocal movement to and from the chamber through the passageway of the member opposite to the cutter in substantial alignment therewith; an elongated feed plunger; means mounting the feed plunger for longitudinal reciprocal movement into and out of the cutter coaxially thereof; means for positioning stuffing material in alignment with the cutter when the feed plunger is retracted therefrom; and means sequentially moving the gripper members toward each other to grasp an olive therebetween, thrusting the cutter into the chamber to core an olive held therein and retracting therefrom, thrusting the pitting plunger into the chamber to eject the pit from the olive therein in the direction of the cutter as the cutter is retracted, moving the feed plunger relative to the retracting cutter and in the opposite direction to eject olive core therefrom, concurrently retracting the feed plunger from the cutter to receive stuffing materials therebetween, the pitting plunger from the chamber and re-inserting the cutter into the olive in the chamber, subsequently thrusting the feed plunger into the cutter for the delivery therethrough of stuffing material into the olive, and concurrently retracting the feed plunger from the cutter, the cutter from the chamber and separating the gripper members to release the stuffed olive.

4,096,796
APPARATUS AND METHOD FOR CONTROLLING PRESS RACKING

Robert J. Saunders, Lewiston, Id., and Harold A. Keller, Clarkston, Wash., assignors to Potlatch Corporation, Lewiston, Id.

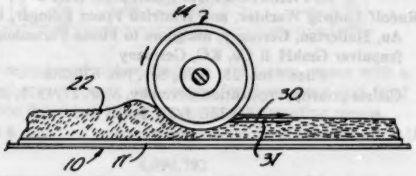
Filed Dec. 22, 1975, Ser. No. 642,710
Int. Cl.[2] B29J 5/00, 5/04
U.S. Cl. 100—35 6 Claims

1. A method for reducing the amount of press racking to which a platen press is subjected during production of reconstituted wood panels due to shingling of elongated wood strands during mat formation in which transversely wood strands overlap one another and lie at acute angles relative to a horizontal plane along the direction of movement of a forming surface on which the mat is supported, the direction of movement of the forming surface being perpendicular to the transverse orientation of the wood strands, said method comprising the following steps:

engaging the mat by a transverse roll at a location downstream of a mat forming unit and upstream of a platen press, said roll having a small uniform diameter outer cylindrical surface of 6 to 11 inches centered about a rotative axis for rolling engagement of the cylindrical surface against the upper surface of the formed mat;

urging the roll toward the formed mat to thereby apply downward pressure against the upper surface of the formed mat in opposition to the forming surface on which the mat is supported;

moving the formed mat beneath the roll at a selected translational velocity;



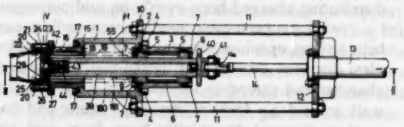
rotating the roll about its rotative axis at an angular velocity such that the roll periphery in contact with the formed mat tangential to a vertical plane through the axis has a translational velocity component parallel and identical to the translational velocity of the mat so that there is no relative movement between the mat and the roll at the area of engagement between them;

the roll diameter and pressure being such as to apply an abrupt vertical downward rolling force to the top surface and interior of the formed mat so as to produce a standing transverse wave across the moving mat immediately upstream of the roll which rearranges the mat structure to thereby reduce the amount of shingling therein and the consequent press racking that would othewise occur during pressing of the formed mat.

4,096,797
METHOD OF COMPACTING SOLIDS-CONTAINING WASTE OR THE LIKE

Niklaus Seiler, Lenzburg, and Hanspeter Seiler, Aarau, both of Switzerland, assignors to Seiler Pumpenanlagen A.G., Erlinsbach, Switzerland

Division of Ser. No. 558,717, Mar. 14, 1975, Pat. No. 4,036,124. This application Mar. 5, 1976, Ser. No. 664,370
Claims priority, application Switzerland, Mar. 18, 1974, 3701/74
Int. Cl.[2] B30B 1/32
U.S. Cl. 100—39 6 Claims



1. A method of compacting solids-containing waste or the like, comprising the steps of accumulating a supply of uncompacted waste in a hopper having a trough-shaped extension provided with a concave internal surface; reciprocating a piston which is retractable into said supply and thereupon moved forwardly and which slides on said surface, so as to intermittently force waste from said supply into an elongated confining path to thereby compact the waste and convert the thus compacted waste into a slug; sealing the front end of the

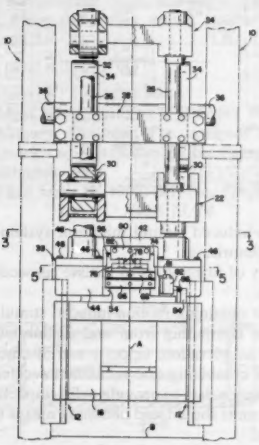
confining path upon completed expulsion of a slug therefrom; and maintaining the front end of said confining path sealed during retraction of the piston from said path into said supply.

4,096,798

PRESS SLIDE ADJUSTING AND OVERLOAD PROTECTION ASSEMBLY

James M. Moskalik, Hastings, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Mar. 14, 1977, Ser. No. 777,006
Int. Cl.[2] F16P *7/00*
U.S. Cl. 100—53 18 Claims



1. A slide adjustment and overload protection assembly for a press including a slide having an axis and driven means to axially reciprocate said slide, said assembly comprising, first and second members coaxial with said slide and connectable one to said slide and the other to said driven means, and interengaging means on said first and second members supporting said members for axial sliding movement relative to one another between normal and overload positions, said interengaging means including adjusting means interconnected with said second member for axial adjustment relative thereto, and overload responsive means interposed between said adjusting means and said first member releaseably holding said members in said normal position, said overload responsive means including a housing removably mounted between said adjusting means and said first member, shearable metal means removably supported by said housing, and shearing member means separate from said shearable metal means and removably supported by said housing, said housing, shearable metal means and shearing member means being removable as a unit from between said adjusting means and said first member.

4,096,799

BALER FOR LOOSE WIRE

Joseph Zupancic, Downey, Calif., assignor to Weiner Steel Corporation, Pico Rivera, Calif.

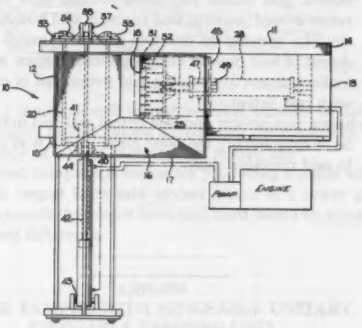
Filed Mar. 11, 1977, Ser. No. 776,513
Int. Cl.[2] B30B *15/30*
U.S. Cl. 100—215 3 Claims

1. A baler for baling loose wire which said baler receives from a loose wire loading device, said baler comprising:

a. a mounting member having a top, a base, a first and a second end;

b. a hopper having an open top, an open base and four sidewalls, said base of said hopper being disposed adjacent to said first end of said mounting member and mounted to said top thereof;

c. a cylindrical member having a first open end and a second open end and also having one-quarter of its sidewall removed to form an opening, said cylindrical member being disposed on said top at said first end of said mounting member so that said opening has a first edge perpendicular to said top of said mounting member and a second edge parallel to said top of said mounting member and faces said second end of said mounting member and also being disposed adjacent to said base of said hopper so that loose wire may enter therein, and said cylindrical member being adapted to receive a heavy pounding;



d. a first plate having a first end and a second end, said plate being disposed on said top of said mounting member and being mechanically coupled to slide reciprocally, horizontally thereon so that its said first end enters said cylindrical member between its said first and second edges and contacts the oppositely disposed portion of said cylindrical member;

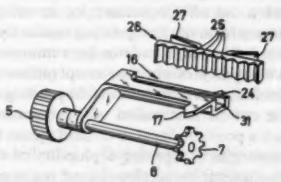
e. hydraulic means for reciprocally driving said first plate, mechanically coupled to said mounting member.

4,096,800

DETENT DEVICE FOR A KEY SHAFT OF A PRINTING MECHANISM

Heinz Kistner, Neckarsteinach, and Heinrich Volk, Beerfelden, both of Germany, assignors to Meto International GmbH, Hirschhorn, Germany

Continuation of Ser. No. 605,783, Aug. 18, 1975, abandoned.
This application Mar. 24, 1977, Ser. No. 780,952
Claims priority, application Germany, Aug. 17, 1974, 2439523
Int. Cl.[2] B41J *1/22*
U.S. Cl. 101—110 5 Claims



1. A printing apparatus for use with a price marking device, said apparatus comprising:

a housing;

a rotatable shaft extending into said housing;

a pinion gear attached to said rotatable shaft;

a plurality of read-out positioning wheels selectively engagable by said pinion gear;

a positioning wheel mounting shaft including an axial recess therein adapted to receive said rotatable shaft, said positioning wheels thereby surrounding said rotatable shaft and said mounting shaft;

a printing type means adapted to be driven by said positioning wheels, said printing type means comprising a plurality of printing type wheels having on the circumference thereof a plurality of printing type characters, said printing type wheels being directly drivable by said positioning wheels;

a pointer carrying means including a pointer attached to said rotatable shaft;

a detent attached to said pointer carrying means;

a detent rail including recesses therein for engaging said detent, said detent rail being located in a channel-like recess in said housing, said recess in said housing having a slot-like opening on one side thereof through which the detent of said pointer carrying means passes; and,

a resilient means for holding said detent rail in engagement with said detent,

wherein said pointer and said detent and said pinion gear all lie in substantially the same plane which is at right angles to said rotatable shaft.

4,096,801

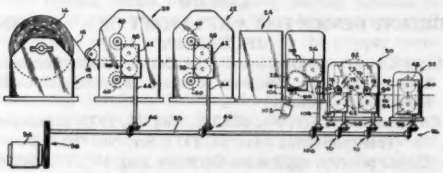
REGISTER CONTROL METHOD AND APPARATUS

John R. Martin, 2516 Harlem Blvd., Rockford, Ill. 61103

Continuation of Ser. No. 222,657, Feb. 1, 1972, abandoned, which is a continuation of Ser. No. 34,798, May 5, 1970, abandoned. This application Jan. 4, 1974, Ser. No. 430,662

Int. Cl.[2] **B41F** *13/02;* **B41J** *15/04, 15/16*

U.S. Cl. 101—227 **3 Claims**



1. In a rotary printing press having at least a first printing station, means for feeding a web continuously to the first printing station, and a cut-off mechanism for severing the web spaced downstream from the first printing station by a substantial predetermined distance, apparatus for automatically maintaining accurate registry of successive operations performed upon the web including printing at the first printing station and severing by the cut-off mechanism without sensing position and feeding back a position signal to control means to maintain registry, said apparatus comprising a plurality of driven rolls for engaging the web at respective spaced positions along its path of travel from the first printing station to the cut-off mechanism, engagement means for causing all of said driven rolls to engage the web at respective ones of said positions without slippage therebetween, said engagement means including means for forcing the web against at least the last of said driven rolls before the cut-off mechanism with force sufficient to preclude slippage therebetween, and motive means for driving all of said driven rolls at respective tangential speeds bearing substantially constant ratios to one another so that the elongation of the web between respective driven rolls is substantially constant, the ratios of speeds being such that the web is maintained in tension without breaking between driven rolls.

4,096,802

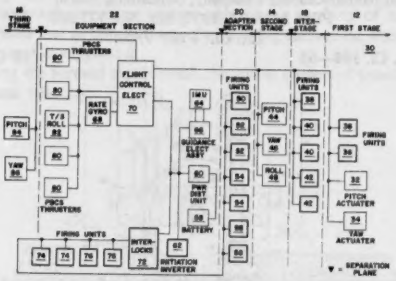
MOTION-INDUCED STIMULI INITIATION SYSTEM

Garry L. Waln, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 26, 1976, Ser. No. 745,131

Int. Cl.[2] **F42C** *11/06*

U.S. Cl. 102—49.5 **4 Claims**



1. A motion-induced stimuli initiation system for a multistage missile comprising:

(a) a plurality of firing units to initiate respective pyrotechnic events;

(b) means for obtaining motion-induced stimuli;

(c) means for computing from said motion-induced stimuli redundant acceleration, velocity and distance data;

(d) means for combining said redundant acceleration, velocity and distance data to provide valid respective outputs to said firing units should said obtaining means incur a partial failure; and

(e) means for comparing said redundant data with predetermined values of acceleration, velocity and distance to assure that said missile has attained a nominal velocity and a safe distance from the launch facility within a predetermined time after launch before initiation of arming of destruct system and of igniting a missile engine and to initiate said pyrotechnic events when said values have been attained.

4,096,803

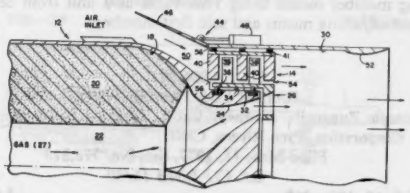
SOLID PROPELLANT AIR TURBO ROCKET

Lawrence W. Kesting, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 27, 1976, Ser. No. 755,390

Int. Cl.[2] **F42B** *9/06*

U.S. Cl. 102—49.5 **1 Claim**



1. An air turbo solid propellant rocket motor comprising:

a. a first chamber loaded with a fuel rich solid propellant and having a combustion space and an exhaust port;

b. a turbine located outside of said first chamber at said exhaust port with blades of said turbine in the exhaust path of gases produced by the combustion of said propellant whereby the passing of said gases cause said blades to rotate;

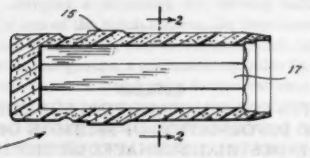
c. a second chamber attached to said first chamber, said second chamber having a combustion space into which said gases from said first chamber pass;
d. a compressor driven by said turbine which compresses atmospheric air from outside said rocket motor and feeds said compressed air into said combustion space of said second chamber, whereby oxygen in said compressed air reacts with fuel in said gases from said first chamber;
e. a nozzle attached to said second chamber through which combustion products of said compressed air and said gases pass into the atmosphere, whereby a thrust is given to a missile;
f. means for jettisoning the compressor and turbine and their respective supporting rings, said jettisoning means being actuated when the rocket motor reaches a velocity of about Mach 2.

4,096,804

PLASTIC/MISCHMETAL INCENDIARY PROJECTILE

Stephen J. Bilsbury, Shalimar, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 10, 1977, Ser. No. 776,387
Int. Cl.[2] F42B *13/14*
U.S. Cl. 102—66 **5 Claims**



1. A plastic incendiary projectile for firing through a weapon having a rifled bore comprising a thermoplastic jacket having an integral rotating band disposed around the outer circumference near the rearward end thereof, said thermoplastic jacket having a substantially hollow inner cavity with an open forward end and a closed rearward end, a core of incendiary material substantially filling the inner cavity of said thermoplastic jacket, and a nose tip of resinous material having a low coefficient of friction disposed over the open forward end of said thermoplastic jacket, the impact of the projectile with a target causing the jacket to rupture thereby allowing said core of incendiary material to brcak up by kinetic energy into lethal particles causing fire to start in the presence of flammable material.

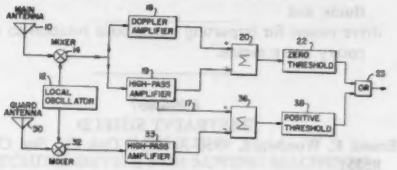
4,096,805

AIR TARGET FUZE DECISION CIRCUIT

Mark S. Miner, Washington, D.C., and Charles W. Crickman, Glen Echo Heights, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 9, 1968, Ser. No. 721,134
Int. Cl.[2] F42C *13/04, 13/00*
U.S. Cl. 102—214 **5 Claims**

1. A decision circuit for a proximity fuze, comprising:
(a) a first antenna connected to a first receiver channel, said first antenna having a pattern having a main beam and a plurality of sidelobes;
(b) a second antenna connected to a second receiver channel, said second antenna having a pattern having a broad beam and a gain of less than said main beam but greater than the gain of said sidelobes of said first antenna;
(c) a first means in said first receiver channel to detect and amplify a valid target return signal;
(d) a second means in said first receiver channel to detect and amplify signals having a frequency different from that of a valid target return signal, said second means having a higher gain than said first means;
(e) a first comparison means for producing a signal when the output of said first means exceeds the output of said second means;



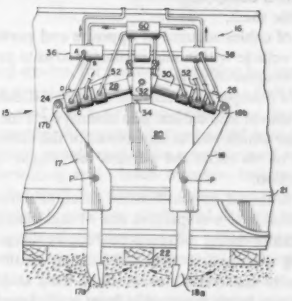
(f) a third means in said second receiver channel to detect and amplify signals having a frequency different from the frequency of a valid target return signal; and
(g) a second comparison means for producing a signal when enough output from said second means at a lower gain point exceeds the output from said third means by a predetermined difference.

4,096,806

TRACK TAMPER WITH HINGEABLE UNITARY PIVOTABLE TAMPING UNIT

Franz Allmer, Sophia, N.C., assignor to Graystone Corporation, Monroeville, Pa.

Continuation-in-part of Ser. No. 632,710, Nov. 17, 1975. This application Nov. 29, 1976, Ser. No. 745,602
Int. Cl.[2] E01B *27/16*
U.S. Cl. 104—12 **8 Claims**



1. A track tamping apparatus of the type comprising a pair of opposed, vibrating tamper arms pivotally mounted on a tamping frame member supported on a carriage, means for positioning corresponding lower ends of the tamper arms on either side of a railroad tie, and means for drawing the vibrating arms together to compact the ballast thereunder, wherein the improvement comprises:
a pair of oscillating cylinders operatively connected between the drawing means and the upper ends of said tamper arms, respectively, such that reciprocation of each oscillating cylinder causes vibration of the respective tamper arms to aid in compacting the ballast, said drawing means being respectively connected to said tamping frame member, each of said oscillating cylinders having a supply line and a return line for filling and evacuating hydraulic fluid from said oscillating cylinder, respectively, said tamper arms, said drawing means, and said oscillating cylinders being operatively connected to said tamping frame member to define a unitary tamping unit;
a frame assembly hingedly connected to said carriage, said frame assembly including vertically adjustable means for

securing said tamping unit thereto so that said tamping unit is vertically movable relative to said frame assembly;

a pair of rotary valve means connected respectively to said oscillating cylinders for alternately communicating said supply and return lines for said respective oscillating cylinders with a common source of pressurized hydraulic fluids; and

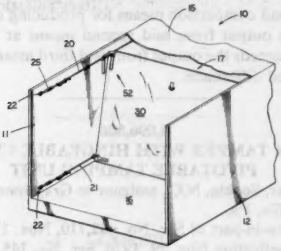
drive means for imparting continuous rotation to each said rotary valve means.

4,096,807

RESTRAINT SHIELD

Ernest F. Woodward, 9950 A Royal Oak Ct., Sun City, Ariz. 85351

Filed Oct. 26, 1976, Ser. No. 735,400
Int. Cl.[2] B61D *45/00*
U.S. Cl. 105—467 **3 Claims**



1. A cargo control restraint shield for use in a vehicle container which comprises:

a flexible sheet;

a pair of cables secured at opposite end portions thereof to said vehicle within said container so as to provide a pair of taut lengths of cable;

a pair of clamps each received upon and slidable on a respective one of said cables, said clamps each including locking means which blocks movement of the clamp in one direction on its cable but permits movement in the opposite direction;

hooks mounted on said flexible sheet, said hooks each being attachable to a respective one of said clamps, said vehicle container being adapted to receive cargo, said clamps being arranged so that said locking means blocks movement of said flexible sheet away from said cargo;

said hooks being detachable from said clamps and connectable to said cables for hanging said flexible sheet out of the way;

said flexible sheet being formed of waterproof material for protection of the cargo within said container, said sheet incorporating stiffening material extending horizontally from one side of said sheet to the other for causing said sheet to engage the sides of said container, said sheet having a generally rectangular configuration with the upper corners thereof cut off at approximately a 45° angle, said hooks being mounted on said flexible sheet at said cut off corner areas with the hooks in board of the rectangular sides of said sheet.

4,096,808

METHOD AND APPARATUS FOR BURNING AIR-SUSPENDED PARTICULATE FUEL

Lorn L. Trickel, 8806 NE. Thompson St., Portland, Oreg. 97220

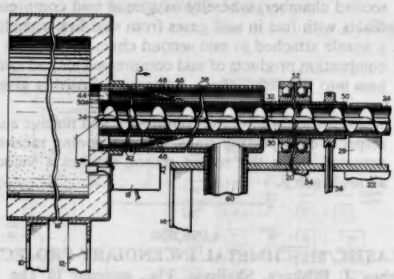
Filed Nov. 11, 1976, Ser. No. 740,862
Int. Cl.[2] F23G *7/00*; F23K *3/02*
U.S. Cl. 110—244 **7 Claims**

1. Apparatus for burning air-suspended particulate fuel comprising:

(a) a pair of radially spaced, substantially coaxial tubes having infeed ends and juxtaposed discharge ends,

(b) mounting means rotatably mounting one of the tubes,

(c) drive means connected to the rotatably mounted tube for rotating it relative to the other of the tubes,



(d) a source of forced draft combustion air connected to the infeed end of the rotatably mounted tube,

(e) fuel feed means arranged for feeding particulate fuel in solid flow into the infeed end of the other of the tubes, and

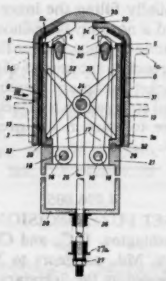
(f) a plurality of spaced, radially directed vanes secured to the rotatably mounted tube at the outfeed end thereof.

4,096,809

APPARATUS FOR COMPENSATING FOR THERMALLY INDUCED DEFORMATION OF SECTIONS OF GRATES IN INDUSTRIAL FURNACES OR THE LIKE

Johannes Josef Martin, and Erich Weber, both of Munich, Germany, assignors to Josef Martin Feuerungsbau GmbH, Munich, Germany

Filed May 16, 1977, Ser. No. 797,186
Claims priority, application Germany, May 21, 1976, 2622965
Int. Cl.[2] F23H *11/00*
U.S. Cl. 110—271 **25 Claims**

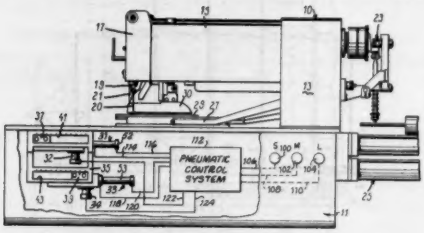


1. Apparatus for compensating for thermally induced dimensional changes of sections of grates in industrial furnaces or of analogous structural elements of the type having an elongated marginal portion extending transversely of the direction of thermally induced expansion or contraction, comprising a side wall adjacent to the marginal portion of a structural element which is subject to expansion or contraction; means for swingably supporting said side wall, including a fulcrum extending in substantial parallelism with the marginal portion of said elements; guide means for said supporting means, said fulcrum being movable with respect to said guide means substantially at right angles to the marginal portion of said element; and means for yieldably biasing said side wall against the marginal portion of said element.

4,096,810
DEVICE FOR VARYING THE POCKET LENGTH PROVIDED ON SEWING MACHINES FOR MAKING WELTED POCKETS

Nereo Bianchi, Pavia, Italy, assignor to NECCHI Societa per Azioni, Pavia, Italy

Filed Sep. 21, 1976, Ser. No. 725,416
Claims priority, application Italy, Oct. 3, 1975, 42907 A/75
Int. Cl.² D05B 3/10
U.S. Cl. 112—65 2 Claims

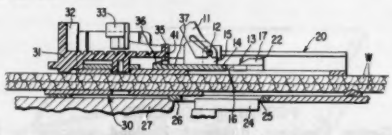


1. In a device for varying the pocket length provided on sewing machines for making welted pockets comprising a bed, a mounting, an arm and a head, two groups with adjustable positioning carrying a mounting for driving valves and a mounting for one of the patch turners, the improvement comprising frames for carrying said valves and patch turner movable relative to said groups, a pneumatic cylinder fixed to each of said groups to move said frames to two extreme positions, corresponding to the two extreme operating positions of said cylinders and defining two sizes of pockets and lock means positioned intermediate said extreme positions to define a pocket size intermediate the other two.

4,096,811
INTERLOCK FOR BUTTONHOLE SEWING PRESSER DEVICE

Walter H. W. Marsh, Fanwood, N.J., assignor to The Singer Company, New York, N.Y.

Filed Jul. 7, 1977, Ser. No. 813,568
Int. Cl.² D05B 3/24
U.S. Cl. 112—77 4 Claims

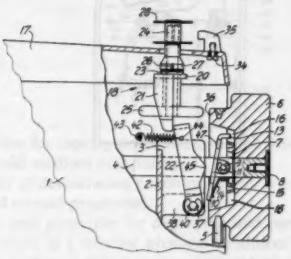


1. In a buttonhole sewing presser device of the type having a work engaging presser foot member, a traveling shoe member, means shiftably supporting said traveling shoe member on said presser foot member for movement with the work being sewn relatively to the presser foot member, stop means defining one extreme relative position between said members, and spring means biasing said traveling shoe member toward said extreme position defined by said stop means, the improvement which comprises clearance between the means shiftably supporting said traveling shoe member on said presser foot member permitting a predetermined amount of relative movement vertically between said members when the presser device is elevated, and cooperating interlock elements carried respectively on said presser foot member and on said traveling shoe member for preventing travel of said traveling shoe member relatively to said presser foot member, and said interlock elements being arranged for engagement when the presser device is elevated and the traveling shoe member occupies a position abutting said stop means.

4,096,812
CLUTCHING DEVICE FOR SEWING MACHINES

Fritz Gegauf, Steckborn, Switzerland, assignor to Fritz Gegauf Aktiengesellschaft, Bernina-Nahmaschinenfabrik, Switzerland

Filed Dec. 16, 1974, Ser. No. 533,211
Claims priority, application Switzerland, Jan. 10, 1974, 273/74
Int. Cl.² D05B 59/00
U.S. Cl. 112—220 4 Claims



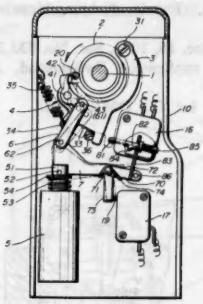
1. A clutching device, for a sewing machine having an arm, a drive wheel, a sewing mechanism including an arm shaft, and a thread winder, said clutching device comprising, in combination, a clutch member interposed between said arm shaft and said drive wheel to couple said drive wheel to said arm shaft; pivot means mounting said clutch member, intermediate its ends, on said arm shaft for pivoting about an axis extending diametrically through said arm shaft; said drive wheel being formed with a series of circumferentially adjacent recesses on its inner surface facing said clutch member, and said clutch member having at least one tooth projecting from one end thereof toward said drive wheel for engagement in one of said recesses; spring means biasing the opposite end of said clutch member away from said drive wheel to engage said at least one tooth in one of said recesses to normally couple said drive wheel to said arm shaft; said thread winder including a drive member and being swingable about a vertical axis to engage said drive member with said drive wheel; means operable by said thread winder, responsive to said swinging movement thereof to engage said drive member with said drive wheel, to engage said clutch member at a point closely adjacent its pivot axis but spaced therefrom toward said opposite end to pivot said clutch member, against the bias of said spring means, to disengage said at least one tooth from the then-engaged drive wheel recess to uncouple said arm shaft from said drive wheel; and further means operable, responsive to accumulation of a predetermined amount of thread on said thread winder, to swing said thread winder in a direction to disengage said drive member from said drive wheel; said means operable by said thread winder, responsive to such disengagement of said drive member from said drive wheel, disengaging said clutch member for biasing of said clutch member, by said spring means, to engage said at least one tooth in one of said recesses to re-couple said drive wheel to said arm shaft.

4,096,813

INTERMITTENT STITCHING DEVICE FOR SEWING MACHINES

Masakatsu Niikura, Kokubunji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Division of Ser. No. 589,533, Jun. 23, 1975, Pat. No. 4,027,610.
This application Mar. 25, 1977, Ser. No. 781,444
Claims priority, application Japan, Jun. 26, 1974, 49-72233
Int. Cl.[2] D05B *69/10*
U.S. Cl. 112—275 6 Claims



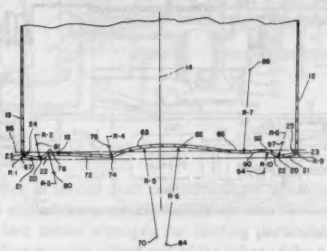
1. A sewing machine comprising, in combination, a machine frame; a main shaft rotatably journalled on the machine frame and operative for vertically reciprocating a needle bar; an electric motor operative for rotating the main shaft; selector switch means having a continuous stitching setting and an intermittent-stitching setting for preselecting continuous or intermittent stitching operation of the sewing machine; user-controlled switch means having a first state and a second state; motor-energization control circuit means connected to said selector switch means and to said user-controlled switch means and operative when the selector switch means is in the intermittent-stitching setting and for so long as the user-controlled switch means is kept in the second state for repeatedly energizing the electric motor at predetermined time intervals; and a stopping mechanism operative when said selector switch means is in the intermittent-stitch setting and for so long as the user-controlled switch means is kept in the second state for stopping the main shaft each time the main shaft reaches a predetermined angular position, the stopping mechanism including engaging means coupled to and sharing the movement of the main shaft, blocking means mounted for movement between an inoperative position remote from and an operative position in the path of movement of said engaging means and operative when in the operative position for blocking the movement of the engaging means and stopping the main shaft in the predetermined angular position, and means operative when the selector switch means is in the intermittent-stitching setting and for so long as the user-controlled switch means is kept in the second state for moving the blocking means into the operative position during successive rotations of the main shaft.

4,096,814

CONTAINER WITH OUTWARDLY FLEXIBLE BOTTOM END WALL HAVING INTEGRAL SUPPORT MEANS AND METHOD OF MANUFACTURE THEREFORE

Joseph Francis Dulmaine, Wheatridge, and Michael Edward Bagrosky, Arvada, both of Colo., assignors to Coors Container Company, Golden, Colo.

Division of Ser. No. 631,539, Nov. 13, 1975, Pat. No. 4,037,752.
This application Jan. 27, 1977, Ser. No. 763,293
Int. Cl.[2] B21D *51/00*
U.S. Cl. 113—120 M 2 Claims



1. A method of forming integral support structure in the bottom wall of a metallic container comprising:

firstly engaging the outer surface of the bottom wall with a first force applying tool having a centrally located protruding convexly curved dome-like area and forming a central wall area of indentation in the bottom wall of generally concave curvature;

secondly engaging the inner surface of the bottom wall with a second force applying tool having a polygonally shaped central cavity defined by elongated peripheral edge surfaces; and

thirdly applying additional force to the outer surfaces of the bottom wall with said curved dome-like area on said first force applying tool and thereby further forming said central wall area of indentation in the bottom wall in said cavity without engagement of the inner surface of the bottom wall in said central area of indentation with said first force applying tool and simultaneously forming elongated peripheral edge surfaces on the outer surfaces of the bottom wall about said central wall area of indentation.

4,096,815

FORMING PROCESS

Philip George Faulkner, Banstead, England, assignor to The British Petroleum Company Limited, London, England

Filed Jun. 28, 1976, Ser. No. 700,557
Claims priority, application United Kingdom, Jul. 8, 1975, 28677/75
Int. Cl.[2] B21D *51/26*
U.S. Cl. 113—120 A 11 Claims

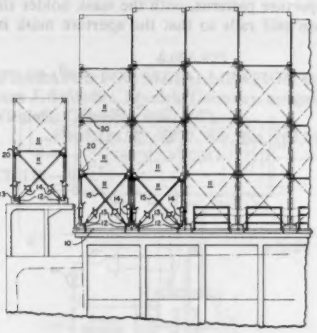
1. A process for forming a metal workpiece involving predominantly plane strain deformation and a change in gauge and providing an inert coating on the finished workpiece which comprises applying directly on the surface of the metal prior to forming a coating, which is not removed after forming, of a composition consisting essentially of a high molecular weight polyolefin, containing in proportion of from 0.1 to 20% by weight of radicals selected from carbonyl groups, carboxyl groups, organic derivatives thereof, carboxylate groups with associated metal ions and mixtures thereof, and then forming the metal with the polyolefin acting as lubricant between the forming tool and the metal.

4,096,816

CONTAINER LASH SYSTEMS

W. W. Patterson, III, Witherow Rd., Sewickley, Pa. 15143, and Eugene F. Grapes, 1106 Eighth Ave., Irwin, Pa. 15642

Division of Ser. No. 611,200, Sep. 8, 1975, Pat. No. 4,048,938.
This application May 6, 1977, Ser. No. 794,670
Int. Cl.[2] B63B *25/08*
U.S. Cl. 114—75 3 Claims



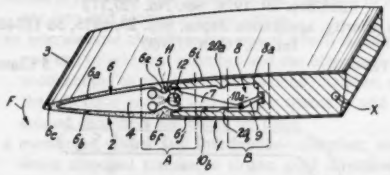
3. A container lashing system for fastening shipboard containers comprising in combination a hollow corner casting on at least each shipboard container roof corner, a rigid elongate lashing bar having at least one generally ball shaped end, a keyhole slot in each corner casting opening into the hollow interior thereof and having an opening receiving said ball shaped end of the lashing bar and a slot receiving said bar adjacent the ball shaped end in sliding engagement and retaining the ball within the corner casting, and means acting on the lashing bar opposite the ball end to place said lashing bar under tension in the corner casting.

4,096,817

SUPPORTING FOIL FOR A HYDROFOIL COMPRISING AT LEAST ONE DEFORMABLE PART

André Jules Edmond Bordat, Aix en Provence, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jun. 17, 1976, Ser. No. 697,270
Claims priority, application France, Jun. 17, 1975, 75 18874
Int. Cl.[2] B63B *1/18;* B64C *9/00*
U.S. Cl. 114—280 7 Claims



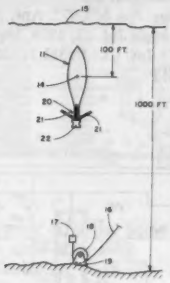
1. A supporting foil for a hydrofoil, comprising a rigid part having an inner cavity, at least one deformable part extending along the leading edge or the trailing edge of the foil over at least a fraction of its span, the deformable part essentially comprising a mobile core of rigid material having a tubular sleeve freely rotatable on a shaft, continuity of profile between the deformable part and the rigid part being provided by a layer of resilient material deposited on to the mobile part and the tubular sleeve thereof and completely embedding them, the mobile core having a rigid prolongation beyond the tubular sleeve, extending into the inner cavity of the rigid part of the foil, and a single elongated connecting member joining the prolongation to the rear wall of the cavity and adapted for enabling the prolongation to pivot the connecting member forming with the prolongation a single mobile wall dividing the cavity in sealing-tight manner into two variable-volume chambers, the chambers receiving and discharging a control fluid.

4,096,818

DROGUE TYPE DECELERATION DEVICE

Richard F. Wameling, Crofton, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1977, Ser. No. 800,110
Int. Cl.[2] B63B *21/48*
U.S. Cl. 114—311 10 Claims



1. A device for rapidly decelerating a high velocity projectile in a liquid medium comprising:

a plurality of decelerating panels pivotably connected to the aft end of said projectile;

means in said projectile for deploying said panels upon the occurrence of a selected pressure condition;

means in said projectile connected to said panels for damping the deployment of said panels; and

coupling means at the aft end of said projectile for bringing said projectile to a selected depth for release,

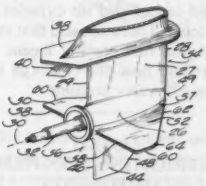
said panels conforming to the outer periphery of said projectile in the inoperative or nested condition.

4,096,819

MARINE PROPULSION DEVICE INCLUDING PROPELLER PROTECTION MEANS

Ralph S. Evinrude, Jensen Beach, Fla., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 3, 1976, Ser. No. 738,528
Int. Cl.[2] B63H *21/26*
U.S. Cl. 115—17 3 Claims



1. A marine propulsion device comprising a lower unit including a gear case which is normally submerged in water and has a forward end, a propeller shaft mounted in said gear case for rotation about an axis and carrying a propeller, and a pair of generally flat, horizontally extending side fins affixed on and extending laterally in substantially coplanar relationship from the opposite sides of said gear case, said fins extending wholly rearwardly from said gear case forward end, each of

said fins having a laterally extending trailing edge located wholly forwardly of said propeller, a generally straight outermost edge extending to a location corresponding to the peripheral path of the propeller and forwardly from said trailing edge generally parallel to said propeller shaft axis, and a leading edge extending at an incline outwardly and rearwardly from said gear case forward end toward said outermost edge.

4,096,820

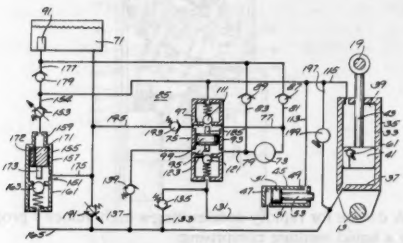
HYDRAULICALLY POWERED MARINE PROPULSION TILTING SYSTEM WITH AUTOMATIC LET-DOWN ASSEMBLY

Charles B. Hall, Ingleside, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 571,077, Apr. 24, 1975, abandoned. This application Jul. 15, 1976, Ser. No. 705,617

Int. Cl.[2] B63H *21/26*

U.S. Cl. 115—41 HT **27 Claims**



6. A marine propulsion device including a member adapted to be attached to a boat hull, a propulsion assembly pivotally connected to said member for vertical swinging movement when said member is attached to the boat hull, a tilt hydraulic cylinder-piston assembly connected between said member and said propulsion assembly and including a tilt cylinder having opposed first and second ends, pressure fluid supply and control means including a control valve housing having first and second ends, first conduit means communicating between said first end of said tilt cylinder and said first end of said control valve housing and including a first valve preventing fluid flow from said first end of said control valve housing to said first end of said tilt cylinder and releasably preventing fluid flow from said first end of said tilt cylinder to said first end of said control valve housing, and second conduit means communicating between said first end of said tilt cylinder and said first end of said control valve housing and including a second valve preventing fluid flow from said first end of said tilt cylinder to said first end of said control valve housing and releasably preventing fluid flow from said first end of said control valve housing to said first end of said tilt cylinder, and a normally closed third valve located between said first end of said control valve housing and said first conduit means and arranged to releasably prevent fluid flow therethrough to and from said first end of said control valve housing.

4,096,821

SYSTEM FOR FABRICATING THIN-FILM ELECTRONIC COMPONENTS

Edwin W. Greeneich, Plum Borough, and William S. Escott, McKeesport, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 13, 1976, Ser. No. 749,870

Int. Cl.[2] C23C *13/03*; B05B *15/04*

U.S. Cl. 118—10 **1 Claim**

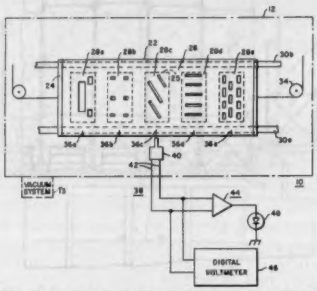
1. A system for fabricating thin-film electronic components upon a substrate comprising:

(a) an evacuable chamber connectable to a vacuum system; and within the chamber are disposed,

(b) at least one evaporant material source;

(c) a substrate holder alignable with the evaporant source;

(d) movable aperture mask means comprising guide means on which is movably mounted a mask holder, a unitary elongated aperture mask supported by the mask holder between the substrate holder and the aligned evaporant source, which aperture mask has discrete spaced apart aperture patterns in a linear array, which guide means are linear parallel rails extending in the direction of the linear array of aperture patterns, with the mask holder slidably mounted on said rails so that the aperture mask is constrained to movement in the direction of the linear array, and wherein the aperture mask has light reflective or absorptive alignment position indicia disposed thereon aligned with each of the discrete spaced apart aperture patterns; and



(e) position indicia sensing and indicating means including fiber optic means, aligned with the substrate holder and the evaporant source, for directing light onto the aperture mask position indicia and for collecting light from the position indicia to permit determining when a desired aperture pattern is aligned between the evaporant source and the substrate.

4,096,822

GASEOUS ATMOSPHERE CONTROL APPARATUS FOR A SEMICONDUCTOR MANUFACTURING SYSTEM

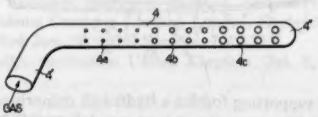
Masao Yamawaki, Handa; Katsuo Aoki, Aichi; Yoshio Oka, Toyota; Takao Suzuki, Kariya; Osamu Ina, Okazaki, and Kunihiko Hara, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 29, 1976, Ser. No. 727,772

Claims priority, application Japan, Sep. 29, 1975, 50-117409

Int. Cl.[2] C23C *11/00*

U.S. Cl. 118—48 **5 Claims**



1. A gaseous atmosphere control apparatus for a semiconductor manufacturing system comprising:

a reaction pipe through which semiconductor wafers are transferred in the longitudinal direction thereof;

a gas distribution pipe longitudinally fixed to the inside wall of said reaction pipe and having a plurality of blow-off holes for supplying heat-treating gas in said reaction pipe, the diameters of said blow-off holes increasing with increase in the distance from the gas inlet of said gas distribution pipe to thereby supply constant amount of heat-treating gas through each blow-off hole; and

a boat positioned slidably in said reaction pipe to be moved

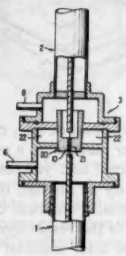
therethrough guided by said gas distribution pipe and having slits in which said semiconductor wafers are supported, said boat having two circular walls which contact both said gas distribution pipe and the inside wall of said reaction pipe to prevent lateral movement of said boat.

4,096,823

APPARATUS FOR METALLIZATION OF FIBERS

Hermann J. Schladitz, Munich, Germany, assignor to University of Virginia, Charlottesville, Va.

Filed Jan. 27, 1977, Ser. No. 763,013
Int. Cl.[2] C23C *13/10*
U.S. Cl. 118—48 10 Claims



1. An apparatus for decontamination and metallization of a filament which comprises

a first decontamination chamber having two concentric tubes having an annular space therebetween, the inner tube of which has a series of holes throughout its length;

heating means for heating the entire length of said inner tube;

means in the outer tube to introduce a gas into said annular space;

a second metallization chamber having two concentric tubes having an annular space therebetween, the inner tube of which has a series of holes throughout its length;

second heating means for heating the entire length of said inner tube of said metallization chamber;

means in the outer tube of said second chamber to introduce gas into said second annular space;

an intermediate chamber, one end of which is connected to one end of said first chamber and the other end of which is connected to one end of said second chamber, such that the adjoining ends of said annular spaces in said first and second chambers are sealed air tight;

a membrane within said intermediate chamber; said membrane disposed transverse to the axial direction of said inner tubes; said membrane dividing said intermediate chamber into two separate regions and said membrane having a small pinhole aperture colinear with the axes of said inner tubes;

said intermediate chamber being fully enclosed except that said inner tubes of said first and second chambers project into the respective ends of said intermediate chamber and except that in each of said regions, said intermediate chamber contains a gas outlet;

means for moving said filament through the inner tubes of said first and second chambers and through said aperture in said membrane; and

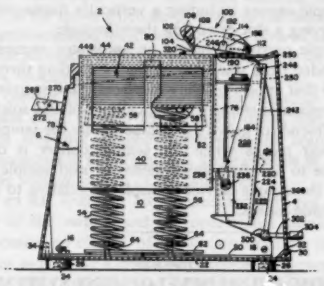
air-tight sealing means for sealing the ends of said annular spaces of said first and second chambers which are unattached to said intermediate chamber.

4,096,824

SLIDE SMEARING DEVICE

Marshall S. Levine, Wayne, and Albert A. Faulkner, Conshohocken, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Jul. 9, 1976, Ser. No. 703,939
Int. Cl.[2] B05C *11/04*
U.S. Cl. 118—100 21 Claims



1. A device for smearing on a slide liquid placed at a predetermined point on the slide comprising:

a slide magazine containing a plurality of slides with the uppermost slide having its upper face exposed for the reception of a drop of liquid towards one end thereof,

a spreader adjacent the other end of the uppermost slide,

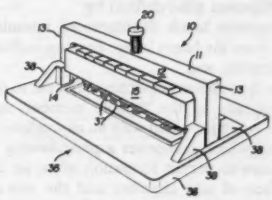
means to advance the spreader to said predetermined point on the slide and to retract the spreader to its original position to smear a drop of liquid placed on the uppermost slide in the magazine.

4,096,825

APPARATUS FOR APPLYING AN ORGANIC LIQUID SAMPLE

Tipton L. Golias, and David Mayes, both of Beaumont, Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

Continuation of Ser. No. 620,736, Oct. 8, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 769,977
Int. Cl.[2] B05C *1/02*
U.S. Cl. 118—221 9 Claims



1. Apparatus for transferring uniform samples of blood or the like onto an absorbent sample support comprising:

means defining a reservoir for receiving a relatively massive sample;

first guide means defining a first vertical guide path aligned with said reservoir means;

a sample carrier vertically displaceable relative to said first guide path toward and away from said reservoir means, said sample carrier being immersible in said sample;

means for vertically displacing said sample carrier relative to said first guide path to removably immerse said carrier into the sample with the sample adhered to the sample carrier by surface tension;

a sample support base; and

second guide means defining a second vertical guide path aligned with said base;

said sample carrier displacing means also vertically displacing said sample carrier relative to said second guide path to removably contact said sample carrier with a sample support on said sample support base to break the surface tension between the sample and the sample carrier and to deposit the sample on the sample support;

said sample carrier including a vertically displaceable slide bar having a slot extending therethrough;

said sample carrier including an applicator element freely suspended from said slide bar and extending through said slot so that upon vertically displacing said sample carrier, said applicator element is vertically displaced solely under the influence of gravity to contact either the sample in said reservoir means when the sample carrier is displaced relative to said first guide means or said sample support when the sample carrier is displaced relative to said second guide means.

4,096,826

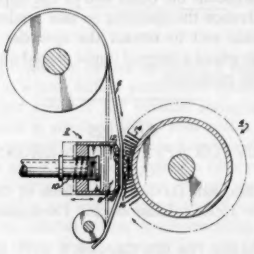
MAGNETIC BRUSH DEVELOPMENT SYSTEM FOR FLEXIBLE PHOTORECEPTORS

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 21, 1976, Ser. No. 688,814

Int. Cl.[2] G03G *15/08*

U.S. Cl. 118—656 **5 Claims**



1. An improved magnetic brush development system for developing a latent electrostatic image on a flexible member, comprising:

(a) a development zone defined by

(i) a magnetic brush development assembly positioned apart from the latent image-bearing surface of the flexible member; and

(ii) deflection means positioned adjacent to the non-image-bearing side of the flexible member, said deflection means being provided with an air-cushion chamber, one wall of which comprises a plate having a plurality of apertures to permit formation of an air cushion at the interface of said chamber and the non-image-bearing side of the flexible member and an actuator assembly, which upon receipt of an appropriate signal from a machine logic, advances the air-cushion chamber and air cushion against the non-image-bearing side of the flexible member to permit feedable engagement of the developer assembly and a latent image-bearing side of the flexible member;

(b) means for coordinating the activation of the activator assembly and moving the flexible image-bearing member; and

(c) means for supplying a pulsating air stream to the air-cushion chamber of the deflection means concurrent

with the activation of the actuator assembly whereby a powder cloud of developer materials is created within the development zone concurrent with the passage through said zone of a latent image-bearing surface of the flexible member.

4,096,827

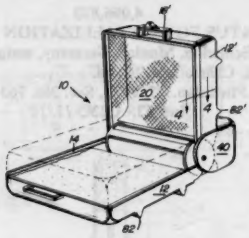
SELF-CLEANING CAT WASTE DISPOSAL DEVICE

James A. Cotter, 9195 Keegan Trail, Missoula, Mont. 59801

Filed Jan. 11, 1977, Ser. No. 758,552

Int. Cl.[2] A01K *29/00*

U.S. Cl. 119—1 **12 Claims**



12. An animal waste disposal device, comprising:

means for holding litter material in a manner which permits easy portability thereof and yet permits easy set up for availability for use by an animal, the holding means including two substantially identical compartments hinged along similar edges of the respective compartments;

means for cleaning the litter material automatically whenever the holding means is arranged for use of the litter material by an animal, the cleaning means including a screen member pivotally mounted between the two compartments for free movement between or with either one of the compartments;

means for receiving waste accumulated by the cleaning means until said waste can be disposed of; and,

a three-way latch structure associated with each of the compartments and the screen between said compartments for positively latching the compartments and the screen together or for latching the screen to either of the compartments.

4,096,828

ROTARY PISTON INTERNAL COMBUSTION ENGINE

Haruhiko Satou; Yoshinori Honiden; Motoyuki Hayashida, and Mutsuo Wakamoto, all of Hiroshima, Japan, assignors to Toyo Kogyo Co. Ltd., Hiroshima, Japan

Continuation of Ser. No. 325,979, Jan. 23, 1973, abandoned. This application Apr. 14, 1976, Ser. No. 676,783

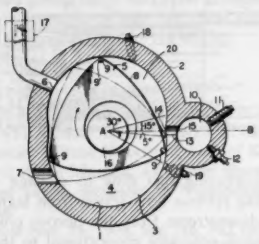
Claims priority, application Japan, Jan. 24, 1972, 47-10219; Jan. 24, 1972, 47-10220; Jan. 24, 1972, 47-10221; Jan. 24, 1972, 47-10222

Int. Cl.[2] F02B *53/10*

U.S. Cl. 123—209 **4 Claims**

1. In a two lobed and three apexed rotary piston internal combustion engine of the Wankel type comprising a housing having a rotor housing having trochoidal inner peripheral surface and side housings having an end wall provided at both sides thereof, a cavity formed by said side housing end walls and said trochoidal inner peripheral surface, said housing being formed with spaced intake and exhaust ports, a rotary piston having three side flanks and eccentrically rotatably mounted on a power output shaft within said cavity, said rotary piston having three circumferentially spaced apexes and substantially flat end faces at opposite ends thereof, each of said apexes and flat end faces having sealing members engaging the inner housing surfaces of said cavity to form between said rotary piston and said housing a plurality of working chambers, a first combustion chamber provided in said housing outside of said trochoidal inner peripheral surface, one of said working chambers

forming a second combustion chamber at the exploding stroke, a fuel injection nozzle and a spark plug provided in said first combustion chamber, the improvement comprising: said first combustion chamber having a volume of 35 to 65% of the sum of the volume of the first combustion and second combustion chambers at engine top dead center, a passage means communicating between said first combustion and second combustion chambers, said passage means opening into said trochoidal inner peripheral surface at a rotary angle in the range of the short axis to 10° after the short axis as defined by the rotary shaft and the intersection of the two arcuate portions of said trochoidal inner surface, and whereby said passage means is



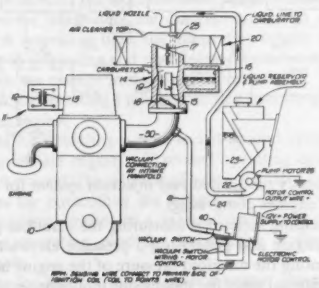
located relative to said intake port such that the intake port is closed off to one of the working chambers by the rotary piston, prior to the leading side apex seal for that chamber opening that chamber to said passage means, said passage means being located circumferentially relative to said exhaust port such that the trailing side apex seal for a given working chamber just crosses over the opening of the passage means to that working chamber as the leading side apex seal relative to that working chamber begins to open the exhaust port, and said passage means comprises a single duct having a cross sectional area smaller than that of said combustion chamber, said cross sectional area being 0.3 to 2.4% of the area of the surface of one of said three side flanks of said rotary piston.

4,096,829

WATER INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

George B. Spears, 8634 Franklin Ave., Los Angeles, Calif. 90069

Filed Apr. 29, 1976, Ser. No. 681,418
Int. Cl.² F02D *19/12*
U.S. Cl. 123—25 J **7 Claims**



1. In liquid injection apparatus for use with an internal combustion engine having an ignition system and an air intake manifold, the combination comprising

a. a liquid pump and electrical drive therefor, the drive including an electrical motor, the pump having an outlet communicable with the engine air intake,

b. and control means including an electrical make or break switch and a pulse rate frequency to analog converter to control electrical current flow to the drive via said switch in response to and as a function of electrical pulses produced by said ignition system, whereby the flow of liquid to the engine air intake will be a function of the pulse output of the ignition system, the switch directly connected in series with the motor,

c. there being a switch actuator connected with the switch, the actuator operatively connected with the engine air intake manifold to close the switch enabling said current flow to the drive when air pressure in the manifold drops to predetermined level, whereby said flow of liquid to the engine air intake will then be established, the switch, when open, blocking current supply to the motor,

d. the control means including a semiconductor connected to pass drive current to the pump drive, and an operational amplifier connected between the converter and semiconductor to supply said drive current as a function of the voltage output of the converter,

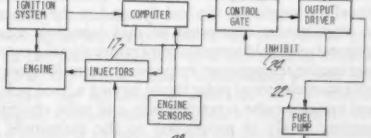
e. and an RC feedback loop connected between the motor side of the switch and the operational amplifier to be responsive to closing of the switch to allow the control means to provide a temporary increase in power supplied to the drive followed by a reduction in power supplied to the drive, whereby the device may be quickly brought up to speed for providing a rapid delivery of liquid to said outlet.

4,096,830

CONTROL SYSTEM FOR ELECTRICALLY ENERGIZED ENGINE FUEL

E. David Long, Elmira, N.Y., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Nov. 6, 1975, Ser. No. 629,349
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 EA **17 Claims**



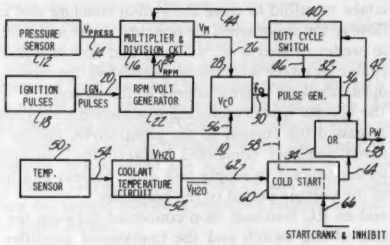
1. A control system for a fuel pump for a spark ignited, internal combustion engine having a fuel injection system, said fuel pump being a solenoid actuated, positive variable displacement piston pump; said control system comprising: means connected to the engine for generating an electric signal which varies as engine speed; and means controlled by said electric signal for generating one trigger pulse per engine cycle to said pump for energizing the solenoid of the pump to reset the piston once per engine cycle to provide a fuel flow at a rate which is a function of said signal, said means for generating one trigger pulse comprising counter means for generating said pulse, gate means for permitting delivery of said pulse to said solenoid once per engine cycle and pulse forming means for changing the duration of said pulse.

4,096,831

FREQUENCY MODULATED FUEL INJECTION SYSTEM

Rajamouli Gunda, Rochester, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 4, 1976, Ser. No. 729,068
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EG **10 Claims**



1. A frequency modulated fuel injection system for internal combustion engines comprising:

pressure sensing means for measuring the manifold pressure of the engine and generating a pressure electrical signal representing said manifold pressure;

means responsive to the rotational speed of the engine and generating a speed electrical signal representing said rotational speed;

function generating means responsive to said pressure and speed electrical signals for generating a control signal directly proportional to a function of both said pressure and speed electrical signals;

means associated with the engine for sensing the temperature of the engine and generating first and second temperature signals which vary as a direct and indirect function, respectively, of the temperature of the engine;

oscillator means connected in responsive relation to said function generating means and said first temperature signal generating means for generating a frequency modulated electrical signal;

pulse generator means connected to said oscillator means for generating an electrical pulse signal in response to said frequency modulated electrical signal having a variable duty cycle, said duty cycle varying depending upon the frequency of said frequency modulated signal;

injection means operative in response to said electrical pulse signal for supplying the fuel demand to the engine; and

cold start means connected to said injection means and responsive to said second temperature signal generated by said engine temperature responsive means for generating a cold start electrical pulse signal having a fixed pulse width and variable pulse repetition rate, said pulse repetition rate varying solely in proportion to the magnitude of said engine temperature responsive means and independent of engine speed, said cold start electrical pulse signal being ORed with said frequency modulated electrical signal.

4,096,832

IGNITION APPARATUS AND METHOD FOR AN INTERNAL COMBUSTION ENGINE

Don C. Casull, 2459 Cardinal Way, Salt Lake City, Utah 84117; James M. Dalton, 253 Elm St., Salt Lake City, Utah 84107; Calvin W. Jackson, 2970 E. 4310 South, Salt Lake City, Utah 84117, and Amos R. Jackson, 2887 McClelland St., Salt Lake City, Utah 84106

Filed Aug. 26, 1976, Ser. No. 717,970
Int. Cl.[2] F02B *19/10*
U.S. Cl. 123—32 SP **14 Claims**

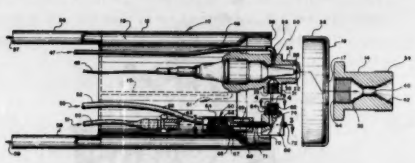
1. An ignition apparatus for a cylinder of an internal combustion engine comprising:

a torch nozzle removably attached to a spark plug thereby enclosing a spark gap of the spark plug in a torch chamber, the torch nozzle being adapted to be screwed into the conventional spark plug opening in an engine block and thereby providing fluid communication between the torch chamber and the cylinder; and

means for introducing fuel and air into the torch chamber comprising:

a fuel supply source of pressurized fuel;

valving means in the fuel supply source upstream from the torch chamber and a means for diffusing the vaporized fuel into the torch chamber, the valving means comprising a porous plug in the fuel supply source, the porous



plug restricting fuel flow to seepage action thereby opposing reverse flow action from higher vapor pressures downstream from the porous plug, the seepage rate being generally proportional to the pressure imposed on the fuel;

means for inhibiting vaporization of the fuel upstream of the valving means;

vaporizing means downstream of the valving means for vaporizing the fuel; and

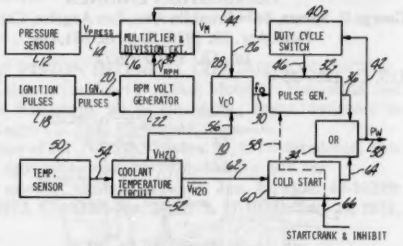
means for diffusing the vaporized fuel into the torch chamber.

4,096,833

CIRCUIT FOR FREQUENCY MODULATED FUEL INJECTION SYSTEM

Charles R. Sweet, Royal Oak, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 4, 1976, Ser. No. 729,070
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EA **16 Claims**



1. A frequency modulated fuel injection system for internal combustion engines comprising:

pressure sensing means for measuring the manifold pressure of the engine and generating a pressure electrical signal representing the manifold pressure of the engine including an operational amplifier having one input connected to the pressure sensing means and the other input connected to receive a reference signal;

means responsive to the rotational speed of the engine and generating a speed electrical signal representing said rotational speed including an operational amplifier and a unijunction transistor connected to an input of the amplifier;

function generator means responsive to said pressure and speed electrical signals for generating an analog signal representative of a direct function of both said pressure and said speed signals;

means for generating a reference signal;

voltage controlled oscillator means responsive to said analog signal and said reference signal for generating a frequency modulated electrical signal including a current source having a magnitude of current flow proportional to said analog signal and storage means connected to said current source, said current source charging said storage means;

pulse generator means connected to said frequency modulated electrical signal for generating an electrical pulse signal having a predetermined duty cycle depending upon the frequency of said frequency modulated signal including a multivibrator circuit having a fixed period; and

injection means connected to said pulse generator means and operative in response to said electrical pulse signal for supplying the fuel demand to the engine.

4,096,834

AIR-TO-FUEL RATIO FEEDBACK CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

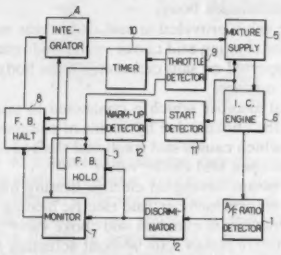
Hideaki Norimatsu; Mitsuo Nakamura, both of Kariya; Toshio Kondo, Anjyo; Akira Masuda, Aichi, and Sigenori Kitajima, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 15, 1976, Ser. No. 742,120

Claims priority, application Japan, Nov. 25, 1975, 50-141433

Int. Cl.[2] F02B *3/00;* **F02D** *33/00*

U.S. Cl. 123—32 EE **14 Claims**



1. An air-to-fuel ratio feedback control system for internal combustion engines comprising:

means for detecting the air-to-fuel ratio of air-fuel mixture supplied to an internal combustion engine;

means for comparing the detected ratio with a preset ratio indicative of the stoichiometric air-to-fuel ratio;

means for integrating the comparison results continuously with respect to time, the integration output value changing in increasing and decreasing directions in accordance with the change in the comparison result;

means for detecting a preselected first operating condition of said engine;

means for detecting a preselected second operating condition of said engine, said second operating condition being indicative of the position of a throttle valve of said engine;

means for controlling the integration output value of said integrating means to a preset constant value during said first operating condition irrespective of the comparison result;

means for holding the integration output value of said integrating means unchanged during said second operating condition irrespective of the comparison result, the unchanged integration output valve being equal to a value produced just before said second operating condition is detected; and

means for supplying said engine with air-fuel mixture of a ratio corrected in accordance with the difference between the integration value and the preset constant value, whereby said mixture supplying means is enabled during said first and second operating conditions, to supply the air-fuel mixture to the air-to-fuel ratio of which is other than the stoichiometric ratio.

4,096,835

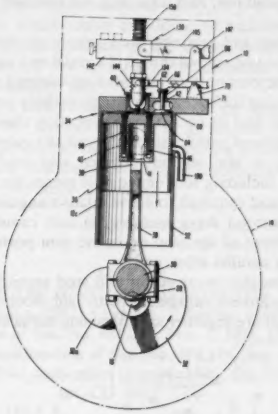
INTERNAL COMBUSTION ENGINE METHOD AND APPARATUS

Charles Edward Lamont, 70 Ethelbert St., Winnipeg, Canada (R3G 1V3)

Filed Jan. 4, 1977, Ser. No. 756,600

Int. Cl.[2] F02B *75/18, 3/04, 75/36;* **F02F** *1/22*

U.S. Cl. 123—52 B **23 Claims**



1. A method of deriving useful work from a gaseous charge and fuel in an internal combustion engine comprising the steps of:

ingesting a gaseous charge into a central chamber defined by a piston, a cylinder and a movable head;

compressing the gaseous charge by moving the piston into the central chamber;

supplying a quantity of fuel to the chamber to create a combustible mixture with the gaseous charge;

moving the movable head to maintain a predetermined schedule of compression ratio in the central chamber;

igniting the combustible mixture of the gaseous charge and the fuel quantity to increase temperature and pressure of resulting combustion products;

transferring at least a portion of the combustion products from the central chamber to a surrounding chamber defined by the cylinder and a cooperating second piston;

expanding the combustion products in the surrounding chamber to atmospheric pressure by allowing the combustion products to push against the second piston which is connected to a shaft that performs work; and

exhausting the expanded combustion products from the surrounding chamber.

4,096,836

VARIABLE TIMING DEVICE PARTICULARLY FOR ENGINE CAMSHAFTS

Leonard F. Kopich, Madison Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 19, 1977, Ser. No. 760,741

Int. Cl.[2] F01L *1/34*

U.S. Cl. 123—90.15 **3 Claims**

1. The combination in an internal combustion engine of the type having an output shaft and a camshaft operable in timed relation with the output shaft of a variable camshaft timing drive comprising

a first rotatable drive member driven by the output shaft,

a second rotatable drive member mounted on the camshaft

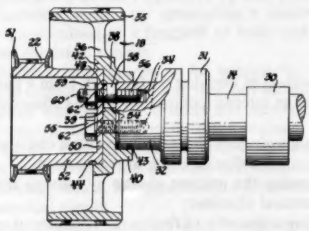
and operably connected with the first drive member for rotation in timed relation therewith,

means mounting said second drive member on said camshaft for rotation on a common axis, said second drive member and said camshaft having opposing engageat le surfaces capable of being secured together to fix the angular relation of said members, said mounting means being formed to permit limited relative angular rotation of said members when said surfaces are not so secured, and

means for adjusting the relative angular positions of said second drive member and said camshaft and for securing said second drive member to said camshaft in their adjusted positions, said adjusting and securing means comprising

an adjusting and retaining stud having an elongated body with first and second threaded coaxial end portions and an eccentric cam portion intermediate said end portions, said stud having its first end portion threadably retained in said camshaft and its eccentric cam portion closely fitted between spaced parallel sides of a radially extending slotted opening in said second member, said stud second end portion including tool engageable means for rotating said stud in said camshaft to cause relative angular adjustment of the second drive member on said camshaft through engagement of the stud eccentric cam portion with said opening parallel sides, and

a nut threadably received on said stud second end portion and operatively engageable with said second drive member to secure together said opposing surfaces of the cam-



shaft and second drive member and prevent rotation of said members and said stud.

3. A drive coupling assembly comprising

first and second rotatable members connected for rotation on a common axis and having opposing engageable surfaces capable of being secured together to maintain said members in fixed angular relation but formed to permit limited relative angular rotation of said members when said surfaces are not so secured, and

means for adjusting the relative angular positions of said members and for securing said members in their adjusted positions, said adjusting and securing means comprising

an adjusting and retaining stud having an elongated body with first and second threaded coaxial end portions and an eccentric cam portion intermediate said end portions, said stud having its first end portion threadably retained in said first member, said stud extending through a slotted opening in said second member distant from said axis with the stud eccentric cam portion positioned within said slotted opening and closely fitting between angularly spaced parallel sides thereof, said second end portion including tool engageable means for rotating said stud in said first member to cause relative angular adjustment of said members through engagement of said stud eccentric cam portion with the parallel sides of said slotted opening, and

a nut threadably received on said stud second end portion and operatively engageable with said second member to secure together the opposing surfaces of said first and second members and prevent rotation of said members and said stud.

4,096,837

AUTOMATIC CHOKING DEVICE OF ELECTRIC HEATING TYPE

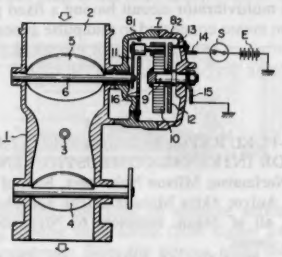
Masahiko Iiyama, Tokyo, and Makoto Ishii, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Dec. 8, 1976, Ser. No. 748,634

Claims priority, application Japan, Dec. 16, 1975, 50/149949

Int. Cl.[2] F02D *11/08;* **F02M** *1/110, 23/04*

U.S. Cl. 123—119 F **34 Claims**



1. An automatic choking device of an electric heating type for use in an automobile engine, and the like which comprises in combination:

(a) a carburetor main body;

(b) a choke valve provided in said carburetor main body;

(c) a shaft for rotating said choke valve, said rotational shaft being supported on said carburetor main body in a freely rotatable manner;

(d) a bimetal member which is connected to said rotational shaft for the choke valve by means of a connecting member, and which causes said rotational shaft to rotate, when heated, to open said choke valve;

(e) heating means having an electric heating mechanism to heat said bimetal member, said electric heating mechanism having functions to maintain said choke valve in a substantially perfectly closed state without actuating said bimetal member when the internal combustion engine is at a low temperature level, to open said choke valve by heating said bimetal as the temperature of the engine rises with lapse of time, and to lower the temperature thereof after the bimetal is sufficiently heated to be able to open the choke valve; and

(f) a switch means to open and close a connecting circuit between said heating means and a power source for the same.

4,096,838

FUEL CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Eizi Tanaka, Anjo; Michihiro Ohashi, Handa; Hiroshi Mochizuki, and Akira Nishimatsu, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 20, 1976, Ser. No. 752,305

Claims priority, application Japan, Dec. 26, 1975, 51-157416; Apr. 6, 1976, 51-38446

Int. Cl.[2] F02M *17/00, 19/00*

U.S. Cl. 123—139 AW **6 Claims**

1. A fuel control system for a spark ignition internal combustion engine having an intake pipe, comprising:

a throttle valve disposed within said intake pipe for controlling the flow of intake air;

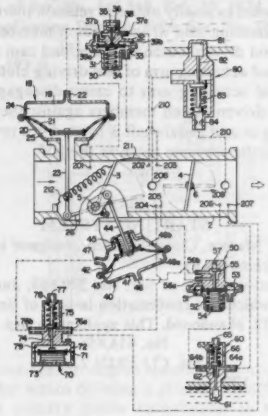
an air-flow measuring member mounted for an angular movement within said intake pipe at a position upstream of said throttle valve, the amount of said angular movement of said air-flow measuring member being substantially in proportion to the flow rate of said intake air;

fuel measuring means operatively connected to said air-flow measuring member and adapted to meter and control the

rate of fuel supply to said engine in accordance with said angular movement of said airflow measuring member, said fuel metering means having a fuel metering shaft unitarily connected to said air-flow measuring member for angular movement therewith and a bearing for rotatably supporting said fuel metering shaft, said fuel metering shaft and said bearing in combination defining at least one variable fuel metering orifice therebetween;

a first pressure-response means connected to said fuel metering shaft so as to drive the metering shaft and adapted to control said angular movement of said fuel metering shaft in response to pneumatic signals;

a second pressure-responsive means connected to said fuel metering shaft so as to drive the metering shaft and



adapted to control said angular movement of said fuel metering shaft in response to pneumatic signals;

a constant-pressure-differential valve adapted to control a pneumatic signal to be applied to said first pressure-responsive means in response to a pressure differential across said air-flow measuring member, thereby to keep said pressure differential at a predetermined value; and

detecting means mounted on said engine for detecting conditions of operation of said engine, and adapted to produce pneumatic signals representative of said conditions, said detecting means being pneumatically connected to said second pressure-responsive means so as to deliver said signals to said second pressure-responsive means;

whereby fuel-air mixtures of an air-fuel ratio corresponding to said conditions are supplied to said engine.

4,096,839

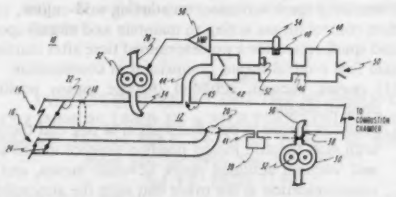
INTERNAL COMBUSTION ENGINE AIR-FUEL RATIO CONTRCL SYSTEM UTILIZING OXYGEN SENSOR

Frank Niertit, Webster, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Feb. 24, 1976, Ser. No. 660,905

Int. Cl.[2] F02M 7/16

U.S. Cl. 123—139 AW **8 Claims**



1. A method for controlling the air-fuel ratio in an internal combustion engine having a combustion chamber arranged to operate at subatmospheric pressures, an intake manifold communicating with the combustion chamber for providing a flow of air to the combustion chamber, adjustable throttle means in the intake manifold for controlling the flow of air through the intake manifold, and fuel pumping means for introducing a first flow of fuel into the intake manifold and producing an air-fuel mixture, the method comprising the steps of:

continuously sampling the air-fuel ratio of the mixture flowing adjacent a first loation in the intake manifold;

continuously adjusting the air-fuel ratio at the first location to the stoichometric value by adjusting the first flow of fuel into the intake manifold;

substantially continuously providing an additional flow of air at a second location in the intake manifold, spaced apart from the first location in the direction of the combustion chamber, and

introducing a second flow of fuel into the intake manifold adjacent the second location in an amount sufficient to reduce the air-fuel ratio of the mixture flowing into the combustion chamber below the stoichometric ratio when engine acceleration is desired.

4,096,840

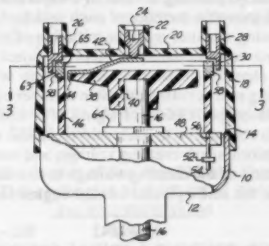
PULSE IGNITION DISTRIBUTOR

Richard J. Jordan, 15821 Chestnut, Roseville, Mich. 48066

Continuation of Ser. No. 654,376, Feb. 2, 1976, abandoned, which is a continuation of Ser. No. 481,196, Jun. 20, 1974, abandoned. This application Dec. 20, 1976, Ser. No. 752,463

Int. Cl.[2] F02P 5/00

U.S. Cl. 123—146.5 A **4 Claims**

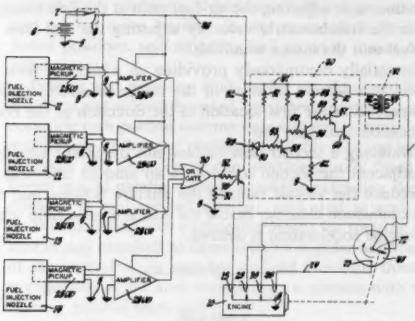


1. In a distributor for a spark-ignition internal combustion engine comprising a distributor body, a removable cap for said body provided with a centrally disposed input terminal and peripherally disposed output terminals each connected to a spark plug of said engine, a rotatable shaft extending through said body, a rotor mounted on the end of said shaft for placing said input terminal successively in spark gap proximity with each of said output terminals in the course of a revolution of said shaft, and timing means comprising a plate angularly positionable relative to said body about said shaft for advancing and retarding ignition as a function of engine RPM, the improvement consisting of a high voltage high frequency generator having an output constantly electrically connected to said input terminal, a dielectric timing ring disposed in said body between said rotor and said output terminals, a current conductive segment for each of said output terminals carried by said timing ring and defining a contactless bridging member disposed in said spark gap corresponding to each of said output terminals, and means for mounting said timing ring on said plate for timing the occurrence of start of sparking through said spark gap relative to degree of angular rotation of said shaft as a function of the angular position of said timing ring relative to said output terminals.

4,096,841
IGNITION SYSTEM FOR USE WITH FUEL INJECTED-SPARK IGNITED INTERNAL COMBUSTION ENGINES

Joseph C. Kindermann, Romeo, and Ronald L. Colling, Millington, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 10, 1976, Ser. No. 694,784
Int. Cl.[2] F02B *15/00, 1/02;* **F02M** *63/06, 51/06*
U.S. Cl. 123—148 E **4 Claims**

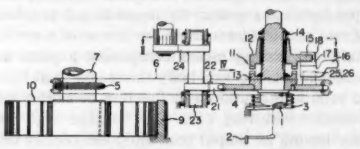


1. An ignition system for use with a fuel injected-spark ignited internal combustion engine of the type having a spark igniting device for each cylinder thereof, comprising: a fuel injector having a movable member corresponding to each cylinder of an associated internal combustion engine for injecting fuel into the combustion chamber of the said cylinder to which it corresponds upon the actuation of said movable member; means corresponding to and in cooperative relationship with the said movable member of each said fuel injector, each said means being responsive to the initiation of actuation of the corresponding said movable member to inject fuel into the combustion chamber of the said cylinder to which said fuel injector having said actuated movable member corresponds for producing an output electrical signal of a selected polarity; circuit means responsive to each said electrical signal for producing an ignition spark creating voltage; and means for directing said ignition spark creating voltage to the said spark igniting device of the said cylinder of said engine next to be fired.

4,096,842
DEVICE FOR WINDING A SPIRAL SPRING TO START AN ENGINE

Noboru Kurata, Kamifukuoka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1976, Ser. No. 750,897
Claims priority, application Japan, Dec. 20, 1975, 50-172608
Int. Cl.[2] F02N *3/04;* **F03G** *1/08*
U.S. Cl. 123—179 S **1 Claim**

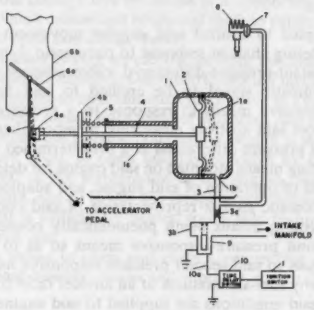


1. An apparatus for winding a spiral spring to start an engine, employing a pedal shaft; a starting pedal connected to said pedal shaft; a driving sprocket rotatably mounted on said pedal shaft having driving teeth formed on the outer periphery thereof; clutch means mounted on said pedal shaft for respectively connecting and disconnecting said pedal shaft and said sprocket for integral or separate rotation in response to forward and reverse rotation of said pedal shaft; ratchet pawl means being engageable with said driving teeth for preventing reverse rotation of said sprocket to permit forward rotation thereof; starter shaft means adapted to be drivingly connected with an engine; and spiral spring means having an inner end secured to said starter shaft means and an outer end to a stationary member; a driven sprocket fixedly mounted on said starter shaft means being operatively connected to said driving sprocket through a power transmission chain, whereby said spiral spring is wound around said starter shaft means as said driving sprocket is rotated in a forward direction, said clutch means comprising: a driving clutch member mounted on said pedal shaft for axial sliding movement and being held against rotation relative thereto, said driving clutch member being provided with an actuating arm extending therefrom in a radial direction; a driven clutch member integrally secured to said driving sprocket in axially opposed relation therewith; a clutch spring for directing said driving clutch member into engagement with said driven clutch member; and cam means cooperating with said actuating arm of said driving clutch member for directing said actuating arm to cause disengagement of said driving and driven clutch members against the action of said clutch spring as said pedal shaft is rotated in a reverse direction to restrict further reverse rotation thereof.

4,096,843
STARTING SYSTEM

Frederick J. Marsee, Clawson, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 370,665, Jun. 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 261,665, Jun. 12, 1972, abandoned. This application Sep. 19, 1975, Ser. No. 614,856
Int. Cl.[2] F02N *17/00*
U.S. Cl. 123—179 A **10 Claims**



1. A system for improving the warm-up characteristics on cold starting of a spark ignition internal combustion engine which comprises in combination

(a) a distributor having at least a vacuum actuated spark advance means and a carburetor having throttle means operatively connected to first control means for simultaneously

(i) opening said throttle means to obtain increased engine speed and

(ii) retarding spark advance, on starting said engine, said first control means acting to maintain said engine speed and spark retard for a predetermined time after starting, said first control means comprising in combination

(1) engine vacuum actuated throttle means position control means,

(2) conduit means in communication at one end thereof with said throttle means position control means and said vacuum actuated spark advance means, and in communication at the other end with the atmosphere and with engine vacuum means,

(3) valve means positioned in said other end of said

conduit, said valve means operable to alternatively connect said conduit means to the atmosphere or to said engine vacuum means,

(b) second control means, said second control means acting to lock out said first control means when a predetermined engine condition exists,

whereby a substantial reduction in exhaust emissions is obtained for the cold start engine operating mode.

4,096,844

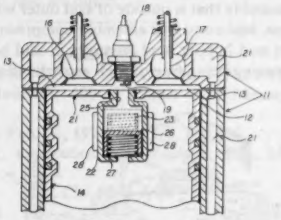
INTERNAL COMBUSTION ENGINE APPARATUS

James Bellamy Mackaness, 28 The Crescent, Chettenham, NSW, Australia (2119)

Continuation of Ser. No. 443,515, Feb. 19, 1974, abandoned. This application Dec. 30, 1976, Ser. No. 755,718

Int. Cl.[2] F02F *1/00*

U.S. Cl. 123—193 P **5 Claims**



1. Internal combustion engine apparatus comprising:

body cylinder means defining a primary combustion chamber; p1 a primary piston reciprocable in said cylinder means during compression and power strokes, respectively, that reduce and increase the volume of said primary combustion chamber;

intake means for periodically introducing fuel charges into said primary combustion chamber;

ignition means for igniting the fuel charges introduced by said charge means;

exhaust means for removing residual gases from said primary combustion chamber after ignition of each fuel charge;

housing means mounted on and movable with said primary piston and defining an auxiliary combustion chamber, said housing means further defining an orifice providing communication between said primary and auxiliary combustion chambers; and

purge means comprising an auxiliary piston reciprocable in said auxiliary combustion chamber, said auxiliary piston being biased by a bias means toward a closed position wherein said orifice is closed and movable during each compression stroke of said primary piston into a fully open position to allow complete filling of said auxiliary chamber with a fuel charge in response to a given pressure in said primary chamber substantially less than the maximum compression pressure provided therein by said primary piston, said auxiliary piston being adapted to move into said closed position during each power stroke of said primary piston so as to purge through said orifice substantially all residual gases from said auxiliary combustion chamber.

4,096,845

SYSTEM FOR REDUCING THE NUMBER OF CYLINDERS USED IN A MULTI-CYLINDER ENGINE

Charles F. Holmes, 804 E. Pembroke, Tuscola, Ill. 61953

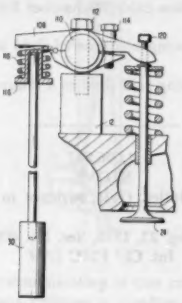
Filed Jun. 30, 1976, Ser. No. 701,272

Int. Cl.[2] F02D *13/06*

U.S. Cl. 123—198 F **13 Claims**

1. A conversion kit for deactivating half of the cylinders of a multi-cylinder reciprocating internal combustion engine of the type having an intake manifold to direct fuel/air mixture into said cylinders wherein said manifold has a first passage communicating with half of the cylinders and a separate, second passage communicating with the remaining cylinders, and having at least one intake valve opening and exhaust valve opening for each cylinder comprising:

(a) means to prevent fuel/air mixture from entering the first of said intake manifold passages, thereby deactivating all of the cylinders served by this passage;



(b) means to maintain each of the intake valve openings in those deactivated cylinders connected by said first intake manifold passage in an opened condition throughout the operational cycle of the engine such that the deactivated cylinders and the first intake manifold passage form a closed chamber; and

(c) means to maintain each of the exhaust valve openings in those deactivated cylinders connected by said first intake manifold passage in a closed condition throughout the operational cycle of the engine.

4,096,846

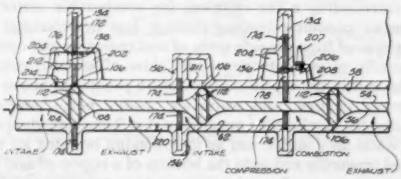
ROTARY FLUID PRESSURE ENGINE

Alfred Biles, 74809 Sunset Dr., Twenty-Nine Palms, Calif. 92277

Continuation-in-part of Ser. No. 503,837, Sep. 6, 1974, abandoned. This application May 17, 1976, Ser. No. 687,381

Int. Cl.[2] F02B *53/00*

U.S. Cl. 123—228 **9 Claims**



1. An engine comprising: an annual cylinder of uniform cross-section forming a cylinder housing;

a rotor positioned in and movable in said cylinder housing, having a width approximately equal to the width of said housing and having a plurality of uniform thickness height sections which are interconnected by at least one enlarged height section;

a plurality of valve members in said cylinder housing each valve member being movable when an enlarged height section passes adjacent thereto;

said valve members being movable in chambers formed in said engine, at least one of said chambers forming a combustion-exhaust chamber and another of said chambers forming a compression-intake chamber and means for supplying an air fuel mixture coupled to said compression-intake chamber;

said valve members in each of said combustion-exhaust chambers have a pair of openings therein, a delay section formed in said combustion-exhaust chamber, one of said openings being movable by said piston enlarged height section and forming a path for enabling an air-fuel mixture to enter said delay section of said combustion chamber, and a second opening in said valve member being movable and forming a path for enabling said air-fuel mixture to pass from said delay section to an ignition section of said combustion-exhaust chamber, and ignition means formed in said combustion-exhaust chamber for igniting said air-fuel mixture;

means for introducing a source of fluid into said cylinder; and

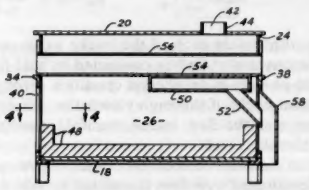
means for exhausting said fluid in a compressed form from said cylinder.

4,096,847

STOVE

Allen L. Mitchell, Butler, Ohio, assignor to Paul David Hill, Ashland, Ohio

Filed Aug. 27, 1975, Ser. No. 608,067
Int. Cl.[2] F24C *1/14*
U.S. Cl. 126—61 **12 Claims**



1. A stove comprising: an enclosure having a front, back, opposite sides and a top surrounding a fire chamber; a transverse warm air conduit opening outwardly of said enclosure; a longitudinally extending warm air conduit opening outwardly of said enclosure; said longitudinally extending conduit being positioned over said transverse conduit; means extending between said conduits to communicate air from said transverse conduit to said longitudinally extending conduit; and a smoke exit opening for said enclosure positioned over said transverse conduit.

9. A stove comprising: an enclosure having four sides and a top surrounding a fire chamber for combustible material a warm air conduit extending through said fire chamber and being spaced from the side walls of said enclosure and opening outwardly of at least one of said sides of said enclosure; a smoke exit in the top of said enclosure positioned above said warm air conduit, said warm air conduit being positioned adjacent the combustible material so that flame extends around said warm air conduit; and an inlet conduit bringing air to be heated upwardly and onto the bottom of a region of said conduit that is remote from the region which opens outwardly of said enclosure.

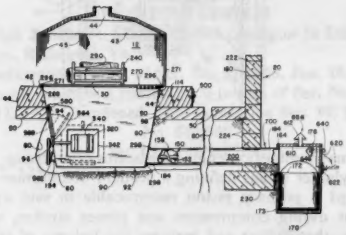
4,096,848

FIREPLACE ASH SYSTEM FOR BASEMENTLESS BUILDINGS

William M. Richman, Hill-Top Heights, North Platte, Nebr. 69101

Continuation-in-part of Ser. No. 331,666, Feb. 12, 1973, abandoned. This application Nov. 5, 1974, Ser. No. 521,167
Int. Cl.[2] F24B *1/18*
U.S. Cl. 126—120 **8 Claims**

1. A fireplace ash removal system, building, and fireplace assembly comprising: a building, said building having a foundation and having a major load-bearing outer wall above said foundation, earth disposed under and against the outer side of at least a substantial part of said building, a fireplace in said building having a hearth and provided with an open side through which fuel can be inserted thereinto, hopper means disposed beneath said fireplace and extending downwardly beyond said floor, said hopper means having opening means on its upper side in communication with the interior of said fireplace for receiving ash therethrough, said fireplace being disposed within the outer sides of said outer walls of said building, an auger conveyor assembly disposed in communication with said hopper for receiving ash therefrom, said conveyor assembly extending from said hopper to a point for delivering ash to said point, said point being on the other side of said major leadbearing outer wall of said building from said hopper, an ash-receiving means disposed at said point, said ash-receiving means having walls and having an ash chamber therein receiving ash from said conveyor assembly and having an ash removal opening through its walls, the region beneath said hearth and the region outside of said building in the vicinities of said ash-receiving means and of that portion of said conveyor assembly that is outside of said outer wall defining a pair of regions, said conveyor assembly comprising a housing leading from said hopper, and an auger in said housing, said conveyor housing being free of such an inclination with respect to



the horizontal that ashes can fall freely therethrough by gravity alone, said conveyor assembly having a drive motor, drive train means drivably connecting said motor to said auger, said motor and drive train means being located in one of said regions, the area above said floor and to the side of said fireplace and the area above the ground outside of said building defining a pair of areas of easy human access, said building and earth defining a building and earth assembly, said building and earth assembly creating an obstruction so great as to leave no passage of over four feet minimum height a human being can pass through from either one of said areas of easy human access so as to enter the space beneath said floor and surrounding said hopper means, said fireplace having a fireplace floor, said fireplace floor and said building floor and said earth all together defining at least a partial barrier to access to the place in which said motor is disposed, said barrier having a service opening means through it providing access to said drive motor for servicing, said fireplace being substantially spaced from the outer walls of said building whereby said auger is important, said hopper having a motor access opening therethrough from an inner side thereof to an outer side thereof and serving as a portion of said service opening means.

4,096,849

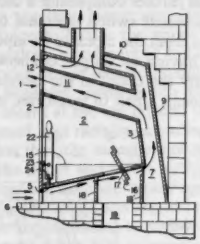
FIREPLACE UNIT WITH SLOPING BED PLATE

Alexander John Moncrieff-Yeates, 8609 Hillside Pl., Fairfax, Va. 22030

Filed Oct. 6, 1976, Ser. No. 729,955
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—121 **9 Claims**

1. In a fireplace unit of the type which includes room air circulating passageway including an incoming room air inlet extending substantially the full width of the unit, and opening into an inlet passageway underlying the bed plate of the fire enclosure, at least one vertical passageway defined in part by a

wall of said fire enclosure, and an air outlet to a room, the improvement wherein said bed plate is sloped upwardly in the direction of flow of incoming air in the underlying passageway as it flows toward said air outlet.

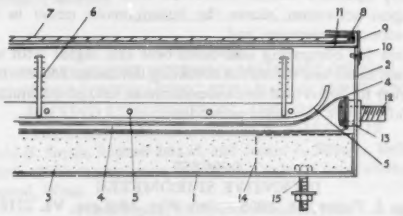


4,096,850

HEAT ABSORBER FOR A SOLAR HEATING SYSTEM

John Mackay Hadcroft, 190 Waimunu Rd., Massey, New Zealand

Filed Feb. 24, 1976, Ser. No. 660,890
Claims priority, application New Zealand, Feb. 24, 1975, 176740
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 8 Claims



1. A heat absorber for a solar heating system, said absorber including a support tray, a flexible heating bag having inlet and outlet connections and arranged to be supported in use by said support tray, and a retaining grill or grid positioned in use on the opposite side of said bag from said support tray and engaging said bag so as to control the depth of said heating bag between said support tray and said retaining grill or grid when said heating bag is filled with liquid.

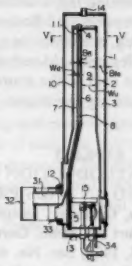
4,096,851

LIQUID HEATING APPARATUS

Noboru Maruyama, No. 26-14, Shirasagi 2-chome, Nakano-ku, Tokyo, Japan

Filed Jul. 23, 1976, Ser. No. 708,189
Claims priority, application Japan, Aug. 11, 1975, 50-96682
Int. Cl.[2] F22B 7/10
U.S. Cl. 126—350 R 4 Claims

1. A liquid heating apparatus comprising a vertical rectangular outer body portion, an inner body portion which has a shape substantially the same as that of said outer body portion, said inner body portion being disposed within said outer body portion and being spaced therefrom to define an outside water jacket therebetween, two vertically oriented plate members disposed within said inner body portion, said plate members being spaced from each other to define an inside water jacket therebetween, said plate members also being spaced from said inner body to define therewith a first chamber which extends alongside one of said plate members and through which heated gas rises and a second chamber which extends alongside the other of said plate members and through which said gas descends, said first chamber communicating with said second chamber at their upper ends, the ratio ξf of the width Wd of said second chamber to the width Wu of said first chamber being equal to or less than 0.8, a flue at the upper end of said first chamber and communicating with said second chamber, a flue gas exit provided at the lower end of said second chamber,



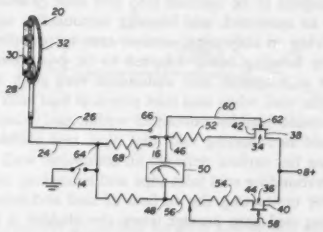
an exhaust pipe communicating at one end thereof with said flue gas exit, means defining a combustion chamber at the lower end of said first chamber, and a combustion air supply tube surrounding the outside of said exhaust pipe and being spaced therefrom, one end of said air supply tube communicating with an opening in the side wall of said outer body portion and thereby communicating with said combustion chamber.

4,096,852

SKIN CONDITIONING INDICATOR

Guy Adams, Monroe, N.Y., assignor to Solitron Devices, Inc., Tappan, N.Y.

Filed Dec. 22, 1976, Ser. No. 753,536
Int. Cl.[2] A61B 5/00
U.S. Cl. 128—2 H 4 Claims



1. A constant current temperature measuring apparatus comprising:

a power source;

leads from said source to provide separate paths for current flow, said paths being characterized as a first leg of the circuit and a second leg of the circuit;

a first field effect transistor in said first leg of the circuit;

a second field effect transistor in said second leg of the circuit;

means connecting said source to the drain terminals of said first and second field effect transistors;

resistance means in each of said first and second leg of the circuit, each said resistance means being connected to a respective source terminal of said first and second field effect transistors, said resistance means in said first leg including a variable resistance whose control arm is connected to the gate of said first field effect transistor and said resistance means in said second leg being connected to the gate of said second field effect transistor;

a first terminal in said second leg of the circuit at the point of

connection of said resistance means with the gate of said second field effect transistor;

a second terminal in said first leg of the circuit after the variable resistance;

an indicator connected between said first terminal and said second terminal; and

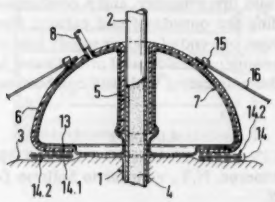
means to recombine said separate paths of said first and second leg of the circuit, said means to recombine having a first switch in said second leg, a calibration means in said second leg beyond beyond said first switch, a probe device in said second leg, a resistor in said first leg, a lead connecting said first leg and said second leg and a second switch connecting the lead to the source in completion of the temperature measuring apparatus.

4,096,853

DEVICE FOR THE INTRODUCTION OF CONTRAST MEDIUM INTO AN ANUS PRAETER

Hanfried Weigand, Mainz, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jun. 15, 1976, Ser. No. 696,404
Claims priority, application Germany, Jun. 21, 1975, 2527706
Int. Cl.[2] A61M *3/00*
U.S. Cl. 128—2 A **10 Claims**



1. A device for the introduction of a contrast medium into an anus praeter formed in an abdominal wall comprising an inlet pipe adapted to be inserted into said anus praeter, a housing having an open end, said housing surrounding said inlet pipe and having an abdominal contact area surrounding said open end, the housing being adapted to be positioned with said contact area against said abdominal wall with its open end facing the wall when said inlet pipe is in said anus praeter, and an inflatable bladder contained within said housing separate from and surrounding said inlet pipe, said bladder having at least one flat surface defining an abdominal wall contact surface surrounding said inlet pipe and extending radially therefrom for contacting the surface of said abdominal wall surrounding said anus praeter when the bladder is inflated, and means for holding said contact area of the housing against said abdominal wall, thereby to hold said flat surface of said bladder against the abdominal wall and form a seat therewith while the inflated bladder holds said inlet pipe against longitudinal movement.

4,096,854

CARDIAC MONITOR WITH RATE LIMIT MEANS

Jacob E. Perica, Warren; Wayne F. Poyer, Ann Arbor, and Neale F. Koenig, Ypsilanti, all of Mich., assignors to Jacob E. Perica, Warren, Mich.

Filed Mar. 1, 1976, Ser. No. 662,540
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—2.05 T **5 Claims**

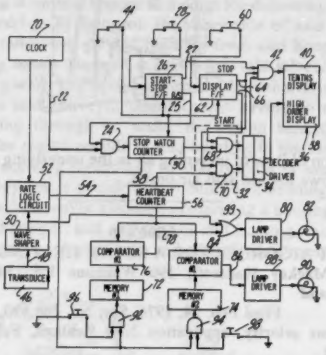
1. A body worn cardiac monitor comprising:

transducer means adapted to be secured to the body of the wearer and adapted to detect heart beats and to produce an electrical signal representative thereof,

means for receiving the signals from said transducer means and producing a heart beat rate signal representative of the heart beat rate per unit time,

display means for displaying said heart beat rate signal,

manually actuated means for variably establishing a pair of separated digital rate limits, said means for establishing said rate limits further comprising a clock and a counter, a manually actuated switch operable upon activation to gate an output from the clock to an input for the counter, said counter having an output connected to the display means whereby the count in the counter is displayed on the display means, a pair of memories, each memory having an input and a gate connected to each input, said counter output being connected to each gate, and a manually operated switch connected with each gate which, upon activation, stores the instantaneous count in the respective memory, and



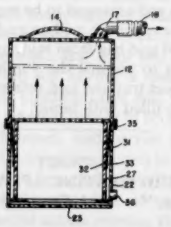
means for comparing said heart beat rate signal with said rate limits and means for actuating indicator means whenever the heart beat rate exceeds one of said preset limits or falls below the other preset limit.

4,096,855

INCENTIVE SPIROMETER

George J. Fleury, Jr., 1005 Abbey Way, McLean, Va. 22101

Filed Dec. 22, 1976, Ser. No. 753,466
Int. Cl.[2] A61B *5/08*
U.S. Cl. 128—2.08 **9 Claims**



1. An incentive spirometer for measuring the volume of inspired air or the volume of exhaled air capable of relatively easy assembly comprising an upper cylindrical housing having an internal cylindrical surface, said upper cylindrical housing having an enclosing top, said top having at least one port means providing communication internally of said upper housing and externally thereof and adapted and constructed to receive a tubular means when said incentive spirometer is used for measuring the volume of inspired air, a lower cylindrical housing having an internal cylindrical surface of the same diameter as the cylindrical suface of the upper housing, said lower cylindrical housing having an enclosing bottom said upper housing being open at its bottom, said lower housing being open at its top, said upper housing at its bottom having a

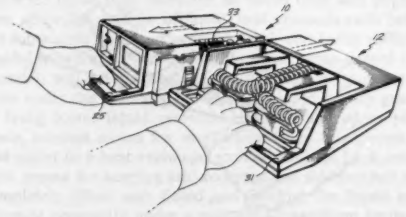
first outwardly radially extending annular flange, said lower housing at its top having a second outwardly radially extending annular flange, said first flange and said second flange being in confronting relating relationship mating said upper and lower housings together, means associated with said first and said second flange to secure the upper housing and the lower housing together, a cylindrical hollow free floating piston being positioned in said secured complementary mating upper and lower housings, saidn piston having outwardly radially extending means at the top portion thereof and at the bottom portion thereof, said radially extending means having a diameter slightly less than the diameters of the internal cylindrical surfaces of the upper and lower housings whereby the said extending means act as guide means against the internal cylindrical surface of the upper housing and the internal cylindrical surface of the lower housing to permit virtually frictionless vertical movement when said spirometer is utilized, said piston having an external diameter less than the diameters of the internal cylindrical surfaces of the upper and lower housings whereby an annular space is defined between said piston and said internal cylindrical surfaces of said housings, a flexible imperforate sleeve being positioned in said space, one end portion thereof being annularly secured to approximately the midportion of said piston, the other end portion being affixed between said first and said second flanges of said housings, said sleeve having a length between its attachment on said piston and its attachment between said flanges of approximately one half of the length of said free floating piston, said upper housing having at least a portion that is transparent whereby any vertical movement of the piston in the upper housing may be viewed, said lower housing having at least one port means providing communication internally of said lower housing and externally thereof.

4,096,856

PORTABLE ELECTRONIC PHYSIOLOGICAL INSTRUMENT HAVING SEPARABLE FIRST AND SECOND COMPONENTS, AND IMPROVED MECHANICAL CONNECTOR THEREFOR

David B. Smith, Mercer Island, and James A. Benson, Bellevue, both of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Filed Sep. 3, 1976, Ser. No. 720,102
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—4.19 D **8 Claims**



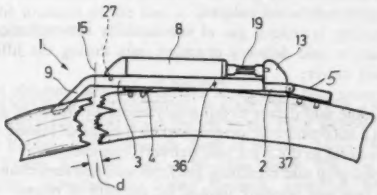
1. A portable electronic physiological instrument including:
a. separable first and second components, said first component comprising an EKG monitor having a pair of signal inputs, and said second component comprising a defibrillator having a pair of paddle electrodes, wherein said components have separate housings, each of said housings having a plurality of exterior surfaces;
b. tongue member means coupled to the housing of one of said first and second components and extending from one of said plurality of exterior surfaces thereof;
c. groove member means coupled to the housing of the other of said first and second components and extending from one of said plurality of exterior surfaces thereof, said groove member means receiving said tongue member means with a translative, sliding fit to provide mechanical interconnection between said first and second components;
d. first and second electrical slide connectors located, respectively, in the housings of said first and second components in proximity to said tongue member means and said groove member means, said first and second electrical slide connectors each including first and second electrical contacts, said first and second electrical contacts of said first and said second electrical slide connectors contacting each other upon said tongue member means being received in said groove member means to provide electrical interconnection between said first and second components; and
e. said first component further comprising means for electrically connecting said pair of signal inputs to said first and second contacts of said first electrical slide connector, and said second component further comprising means for electrically connecting said pair of paddle electrodes to said first and second electrical contacts of said second electrical slide connector.

4,096,857

TELESCOPICALLY ADJUSTABLE SURGICAL INSTRUMENT

Rudolf Cramer, Piesenkam, and Juergen J. Hildebrandt, Brunnthal, both of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Germany

Filed Dec. 27, 1976, Ser. No. 754,127
Claims priority, application Germany, Jan. 20, 1976, 2601938
Int. Cl.[2] A61F *5/04*; A61B *17/18*
U.S. Cl. 128—84 R **6 Claims**



1. A telescopically adjustable surgical instrument, especially for performing an elongation osteotomy, comprising rigid guide rail means including a first end and a second end, recess means in said guide rail means extending from said second end toward said first end, rigid extension rail means having an inner end and an outer end, said inner end being received for axial movement in said recess means of said guide rail means, first bone connecting means forming part of said first end of said rigid guide rail means, second bone connecting means operatively secured to said rigid extension rail means, first extension actuator support means operatively connected with said rigid guide rail means, second actuator support means operatively connected to said rigid extension rail means, and connector means for rigidly but releasably securing said guide rail means and said extension rail means to each other, said first extension actuator support means comprising connecting means located in said rigid guide rail means substantially adjacent to said first end, wherein said second actuator support means comprise support block means releasably secured to said rigid extension rail means substantially at the outer end thereof, and wherein said connector means comprise set screw means.

4,096,858

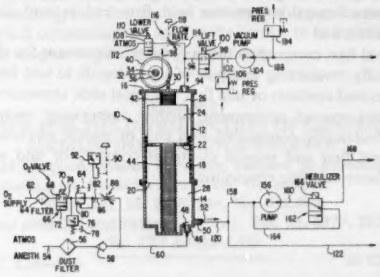
VOLUME-RATE RESPIRATOR SYSTEM AND METHOD

Theodore B. Eyrick, Reading; Allen C. Brown, Acton, and Neil R. Hattes, Danvers, all of Mass., assignors to Chemetron Corporation, Chicago, Ill.

Division of Ser. No. 545,287, Jan. 29, 1975, which is a division of Ser. No. 402,677, Oct. 2, 1973. This application Dec. 20, 1976, Ser. No. 752,753

Int. Cl.[2] A61M *16/00*

U.S. Cl. 128—145.6 **7 Claims**



1. In a respirator system, the method of delivering a variable but selectable volume of breathing gas at a preselected limited rate, comprising:

mounting a gravity-operated driver for vertical motion within a closed housing;

defining within said housing an upper control chamber above said driver and a lower delivery chamber below said driver, said chambers being divided by a diaphragm connected between said driver and said housing;

producing a vacuum within said control chamber to lift said driver and thereby expand said delivery chamber;

controlling said vacuum to regulate the distance and the rate at which said driver is lifted to expand said delivery chamber to a selected volume;

admitting breathing gas at substantially atmospheric pressure to said delivery chamber only during the lifting of said driver;

releasing said vacuum at a controlled and variable rate to enable said driver to fall solely under the force of gravity at a maximum rate determined by the rate of release of said vacuum to contract said delivery chamber;

discharging said breathing gas from said delivery chamber at a rate and pressure limited by the rate of release of said vacuum and the weight of said driver; and

periodically and alternately producing and releasing said vacuum for drawing in and discharging breathing gas in a breathing cycle.

4,096,859

APPARATUS FOR PERITONEAL DIALYSIS

Mahesh C. Agarwal, 6040 Bathurst St., Suite 1707, Toronto, Ontario M2R 2A1, and Joseph E. Dadson, 2515 Bathurst St., Suite #503, Toronto, Ontario, both of Canada

Filed Apr. 4, 1977, Ser. No. 784,416

Int. Cl.[2] A61J *7/00*; B01D *13/00*; A61M *5/00*

U.S. Cl. 128—213 **18 Claims**

1. A dialysis apparatus comprising:

first means for supplying dialysis fluid,

second means for measuring a predetermined quantity of dialysis fluid,

third means for detecting a minimum quantity of dialysis fluid,

a catheter,

structural means supporting said first means above said second means, said second means above said catheter and said third means below said catheter,

a said fluid flow path interconnecting said first and second means,

a second fluid flow path interconnecting said second means and said catheter,

a third fluid flow path interconnecting said catheter and said third means,

a fourth fluid flow path for fluid draining from said third means,

valve means for selectively

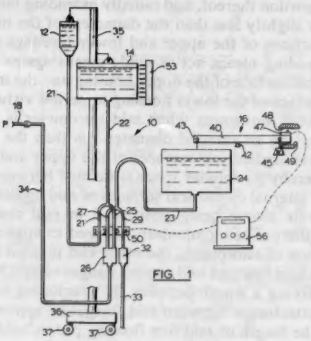


FIG. 1

(i) blocking said first and third paths while leaving said second and fourth paths open,

(ii) blocking said second and third paths while leaving said first and fourth paths open, and

(iii) blocking said second and fourth paths while leaving said first and third paths open,

and timer/computer means for dictating the time intervals during which the valve means is in modes (i), (ii) and (iii).

4,096,860

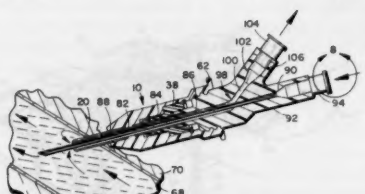
DUAL FLOW ENCATHETER

William F. McLaughlin, 67 Balboa Cove, Huntington Beach, Calif. 92663

Filed Oct. 8, 1975, Ser. No. 620,600

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—214.4 **10 Claims**



1. An apparatus for simultaneously withdrawing and implacing fluid within a blood vessel comprising:

an insertion conduit suitable for extending into a blood vessel;

a hub connected to said insertion conduit having means to connect said insertion conduit to a device for withdrawing fluid from a blood vessel;

one-way valve means in fluid connected relationship to said insertion conduit to prevent the flow of fluid through said insertion conduit from said blood vessel;

a biaxial branch flow device having first and second branches and a main conduit within said device being in fluid communication with said insertion conduit through said hub;

said first branch within said biaxial flow device adapted for receiving fluid from said insertion conduit; and,

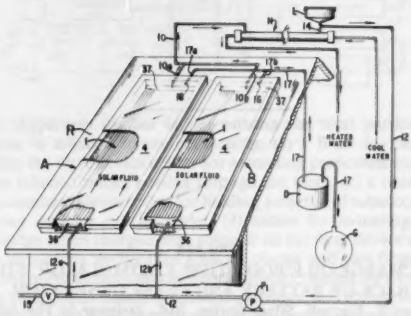
a tube connected with said biaxial branch flow device for coaxially passing through said insertion conduit valve means and said main conduit in spaced relationship from the interior walls of said main conduit to allow fluid flow therebetween and wherein said tube is connected at one end to said second branch and extends at its other end to the end of or beyond the distal end of said insertion conduit.

4,096,861

SOLAR HEAT COLLECTION

Vernon O. Bowles, Naples, Fla.

Filed Apr. 12, 1976, Ser. No. 676,156
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **19 Claims**



1. Apparatus for collecting solar heat comprising a substantially planar radiation receptor adapted to be supported at an inclination across the path of sunlight, said receptor being composed essentially of thin sheet material and comprising a thin front panel exposed to the solar radiation, a back panel and means interconnecting said panels peripherally and in and along laterally spaced longitudinal regions thereof so as to define between them a shallow fluid-tight chamber subdivided into a multiplicity of long shallow channels for confining liquid filling them to a thin layer and extending from a common plenum space in the lower end of the chamber to a common plenum space in its upper end, an inlet to said lower plenum space for liquid flow thereinto, an outlet from said upper plenum space for outflow of liquid, said channels each being of not more than $\frac{1}{4}$ inch in average depth and being sufficiently limited in width so that liquid filling and being heated in said channels will not distort them and will flow only upwardly in them under the influence of thermal-specific gravity gradients to bring hotter liquid perferentially into said upper plenum space, conduit means for conducting liquid in a circuit from said outlet to a heat exchnage zone and thence back into said inlet, means for keeping said receptor and said conduit means completely filled with liquid and holding the liquid in said receptor constantly under a substantially uniform limited hydrostatic pressure insufficient to rupture said receptor, and means for continuously circulating the liquid in said circuit into and upwardly through and from said receptor under a constantly low pumping pressure sufficient to prevent substantial deviation from said hydrostatic pressure as said liquid is being circulated,

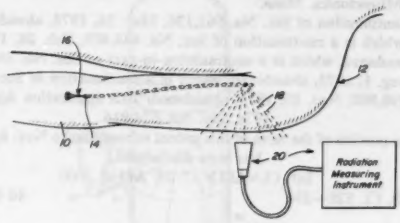
said heat exchange zone comprising a heat exchanger having therein passageway connected in said circuit with said conduit means for conducting said liquid along one side of heat transfer walls adapted to be contacted over their other side by a fluid to be heated, said liquid circulating means including a pump in said conduit means, means for flowing said fluid through said heat exchanger in contact with said other side of said walls, means for sensing the temperature of liquid in said chamber, means activated by said sensing means for operating said pump when said temperature exceeds a first predetermined level, a second means for sensing the temperature of liquid being pumped through said circuit, and means activated by said second means for operating said means for flowing said fluid when the latter temperature exceeds a second predetermined level higher than said first level.

4,096,862

LOCATING OF TUBES IN THE HUMAN BODY

Salvatore A. DeLuca, 607 Revere Beach Blvd., Revere, Mass. 02151

Filed May 17, 1976, Ser. No. 687,103
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—348 **2 Claims**



1. A method for locating internal lines within a passage of a patient's body, comprising the steps of:

(a) inserting a line into a passage of a patient;

(b) inserting a finite radioactive source into the line inserted by step (a), the inserting step (b) including the step of placing a single discrete radioactive element inside a sheath closed only at one end for preventing contamination of the radioactive element; and

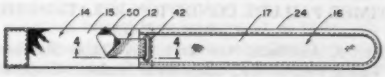
(c) monitoring with a radiation measuring instrument the radioactive source inserted by step (b) and determining the location of the line at the position of the radioactive source.

4,096,863

BAND FOR ANCHORING A CATHETOR OR ANY OTHER TUBULAR DEVICE TO THE BODY

David Kaplan; Irving Brezack, both of Sharon, Mass.; Nathan H. Young, deceased, late of Boynton Beach, Fla.; by David Kaplan, executor; by Irving Brezack, executor, both of Sharon, Mass., and Herbert H. Wapner, Canton, Mass., assignors to Baka Manufacturing Company, Inc., Plainville, Mass.

Continuation-in-part of Ser. No. 612,364, Sep. 11, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,804
Int. Cl.[2] A61M *25/02*
U.S. Cl. 128—349 R **13 Claims**



1. A band for anchoring a catheter or other tubular device to the body comprising;

an extendible primary strap adapted to encircle the portion of the body to which the device is to be anchored,

fastening means connected to the primary strap for securing it in place on the body,

a secondary strap means made of a flexible material and having a length less than the length of the primary strap, means for connecting one end of the secondary strap means

to the primary strap intermediate the ends of the primary strap,

a relatively rigid clip having an eye through which another end of the secondary strap means may be threaded to form a loop for encircling the device,

means for securing the clip to the primary strap adjacent the one end of the secondary strap means and thus fixed with respect to said one end,

and additional fastening means at the other end of the secondary strap means for retaining the end through the eye with the loop tightly bound about the device.

4,096,864

FLUID CARRYING SURGICAL INSTRUMENT OF THE FORCEPS TYPE

Harold D. Kletschka, Minneapolis, and Edson D. Rafferty, Excelsior, both of Minn., assignors to Bio-Medicus, Inc., Minnetonka, Minn.

Continuation of Ser. No. 562,126, Mar. 26, 1975, abandoned, which is a continuation of Ser. No. 446,408, Feb. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 384,461, Aug. 1, 1973, abandoned, which is a continuation of Ser. No. 198,900, Nov. 15, 1971, abandoned. This application Apr. 8, 1976, Ser. No. 674,916

The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.

Int. Cl.[2] A61B *17/28;* A61M *1/00*

U.S. Cl. 128—354 **44 Claims**

33. A suction surgical instrument comprising:

(a) at least one elongated leg member of predetermined length and having a functional end constructed to perform a surgical function;

(b) a fluid conduit tube externally affixed to at least a portion of said elongated leg member, said fluid conduit tube being adapted for connection to a source of fluid pressure;

(c) said fluid conduit tube terminating in an open end of predetermined cross sectional size disposed proximate the extreme functional end of said one elongated member, said open end lying in a substantially oblique plane which transects the fluid conduit tube, whereby the cross sectional size of the open end is greater than the internal perpendicular cross sectional size of the fluid conduit tube;

(d) and first and second transverse openings formed through the wall of the fluid conduit tube in a position spaced from said open end, said transverse openings being of lesser cross sectional size than said open end and disposed on opposite sides of the fluid conduit tube.

4,096,865

METHOD AND APPARATUS FOR MONITORING A TIMED FAILURE CONDITION RELATIONSHIP IN A CARDIAC PACER

Albert A. Auerbach, New York, and Sidney Steinberg, Spring Valley, both of N.Y., assignors to Medalert Corporation, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,952

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—419 PT **7 Claims**

1. An improvement for detection of a sensing failure in a pacer for cardiac pacing and condition monitoring, including generating means for providing periodic cardiac stimulating signals over a predetermined time period, sensing means responsive to cardiac activity for providing an electrical signal in accordance with said cardiac activity, comparing means for comparing a threshold signal level to said electrical signal, and monitoring means providing a first output signal for changing the electrical characteristics of the signals provided by said generating means by a first amount sufficient to be discernible when said comparing means indicates that said electrical signal did not exceed said threshold level, said sensing means responsive to each spontaneous cardiac event for resetting said generating means to the initial level of said predetermined time period, the improvement comprising means for providing a first signal corresponding to each said initial level, means for providing a second signal in accordance with each said spontaneous cardiac event, means for coincidently comparing said first and second signals, means for generating a second output signal in response to said first and second signals not coinciding, said lack of coincidence indicating a sensing failure, and means responsive to said second output signal for changing the electrical characteristics of the signals provided by said generating means by a second amount sufficient to be discernible.

4,096,866

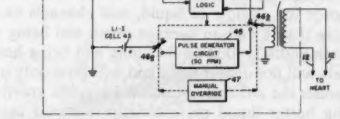
RECHARGEABLE BODY TISSUE STIMULATOR WITH BACK-UP BATTERY AND PULSE GENERATOR

Robert E. Fischell, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 682,505, Apr. 30, 1976, abandoned. This application Jul. 29, 1977, Ser. No. 820,545

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—419 PG **8 Claims**



1. An implantable stimulator for applying electrical stimulation to body tissue of a patient comprising,

means constituting a source of operating energy,

generator means operably connected to receive operating energy from said source means for generating said electrical stimulation,

said generator means including a circuit means forming a first primary generator of electrical stimulation and a circuit means forming a second stand-by generator of back-up electrical stimulation,

circuit means operably connected to said first primary and second stand-by generators for applying said electrical stimulation, and

control means responsive to the output of said first primary generator for selectively rendering said second stand-by generator effective to apply said back-up stimulation if said first primary is not properly generating said electrical stimulation.--

4,096,867

APPARATUS FOR PYROLYZING TOBACCO

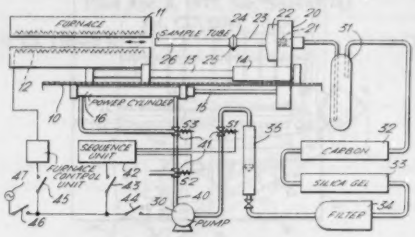
Terence Michael Long, Yatton, and Clifford Hendrik Henneveld, Oldland Common, both of England, assignors to Imperial Group Limited, London, England

Filed Oct. 12, 1976, Ser. No. 731,223

Claims priority, application United Kingdom, Oct. 10, 1975, 41648/75

Int. Cl.[2] A24F *1/10, 47/00*

U.S. Cl. 131—171 R 9 Claims



1. Apparatus for use in determining the total particulate matter in tobacco smoke comprising, (a) a filter device, (b) within the filter device a filter for extracting particulate matter from tobacco smoke passing through the filter, (c) a reusable non-combustible cartridge for holding a charge of tobacco and having an inlet and an outlet, (d) means for mounting the cartridge when charged with tobacco on the filter device such that air passing through the tobacco charge will pass from the cartridge outlet through the filter, (e) heater means for pyrolysing the tobacco charge within the cartridge, and for enclosing at least a portion of the cartridge including the inlet tobacco, (f) pump means to draw air continuously through the tobacco charge and filter, and, (g) control means (i) for controlling the heater means to pyrolyse the tobacco charge, (ii) for controlling the pump means to draw air continuously through the charge and thence through the filter until the charge has been completely pyrolysed, and, (iii) for thereafter resetting the apparatus for pyrolysis of a further charge of tobacco within the cartridge.

4,096,868

SMOKING APPARATUS AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Tom Norman, Flint, Mich.

Filed Nov. 5, 1976, Ser. No. 739,076

Int. Cl.[2] A24F *1/30*

U.S. Cl. 131—173 5 Claims

1. A smoking apparatus comprising:

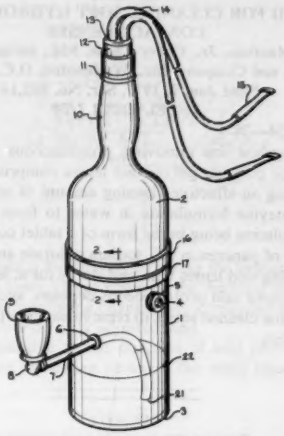
an open top bottle of the commonly-available type having an elongated upper neck portion with a cross section substantially smaller than a similarly oriented cross section of said bottle near the bottom closed end of said bottle, said bottle being substantially of the same general configuration as a standard beverage bottle:

said bottle being segmented to form a lower bottle portion including a closed bottom end and an open top section large enough to enable standard size ice cubes to pass therethrough, and an upper bottle portion including an open top end and an open bottom section adapted to detachably engage said open top section of said lower bottle portion;

a first aperture provided in said lower bottle portion, said first aperture having removably disposed therein a tube extending from said first aperture;

said tube having detachably secured at the outer end thereof a pipe bowl for retaining therein at least one smokable product, while the inner end of said tube extends downwardly into the interior of said lower bottle portion into close proximity with said closed bottom end of said lower bottle portion so as to be submerged within a liquid and/or ice cooling medium selectively disposed in said lower bottle portion for cooling smoke which passes from said smokable product through said tube into said lower bottle portion;

a second aperture provided in said lower bottle portion, said second aperture being disposed above the level of said cooling medium to serve as a ventilation hole for said apparatus;



a removable stopper member disposed in said open top end of said upper bottle portion to substantially cover and seal said open top end;

said stopper member having provided therethrough at least one aperture; and

a tube provided in said aperture of said stopper member and extending outwardly therefrom to enable a user of said smoking apparatus to inhale smoke therethrough.

4,096,869

FORMULATION FOR THE DISSOLUTION OF GYPSUM

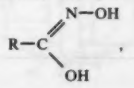
Michael B. Lawson, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed May 5, 1977, Ser. No. 794,277

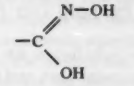
Int. Cl.[2] C23G *1/02*

U.S. Cl. 134—3 10 Claims

1. A method for dissolving gypsum comprising contacting said gypsum with a solvent composition consisting essentially of water and an agent selected from the group consisting of a hydroxamic acid, represented by the formula



an alkali metal salt of said hydroxamic acid, an amine salt of said hydroxamic acid, an alkanol amine salt of said hydroxamic acid and mixtures thereof wherein R is selected from hydrogen, alkyl groups having 1 to 10 carbon atoms and the group



and further wherein said salts are those derived from the reaction of said acid with alkali metal hydroxides, ammonia, ammonium hydroxide, ethylenediamine, monoethylamine, mono-

methylamine, monoethanolamine, diethanolamine, triethanolamine and mixtures thereof.

4,096,870

METHOD FOR CLEANING SOFT HYDROPHILIC GEL CONTACT LENSES

John A. Manfuso, Jr., Chevy Chase, Md., assignor to Burton, Parsons and Company, Inc., Washington, D.C.

Filed Jun. 9, 1977, Ser. No. 805,147
Int. Cl.[2] B08B *3/08*
U.S. Cl. 134—28 **7 Claims**

3. A method for removing proteinaceous deposits from hydrophilic polymer gel contact lenses comprising:

dispersing an effective cleaning amount of an eye-compatible enzyme formulation in water to form a slurry, said formulation being in the form of a tablet consisting essentially of pancreatin 4X, sodium chloride and boric acid;

contacting said lenses with said slurry for at least 10 minutes to remove said proteinaceous deposits; and

rinsing the cleaned lenses to remove pancreatin from the lens surfaces.

4,096,871

DRAIN OPENING METHOD

Eftichios Van Vlahakis, Northbrook, Ill.

Continuation-in-part of Ser. No. 614,306, Sep. 17, 1975, abandoned. This application Apr. 13, 1976, Ser. No. 676,570
Int. Cl.[2] B08B *7/04;* **C23G** *1/02*
U.S. Cl. 134—40 **1 Claim**

1. A method of opening domestic or industrial drain clogs comprising of the steps of:

a. contacting said clog with an aqueous sulfuric acid composition, consisting essentially of an aqueous solution of between 80.8% to 84.5% by weight of sulfuric acid, 0.1–0.5% by weight of corrosion inhibitors, and 15.0–19.1% by weight of inert materials including 10–19% by weight of water, to dissolve said clog in less than 5 minutes;

b. said composition producing heat of solution upon dissolution with water in said drain adjacent said clog in the range of 1:1±0.1 by volume in an amount sufficient to raise the temperature of fluid adjacent said clog in the range of about 161° F (71.6° C) to 172° F (77.8° C); and

c. flushing said dissolved clog material with water.

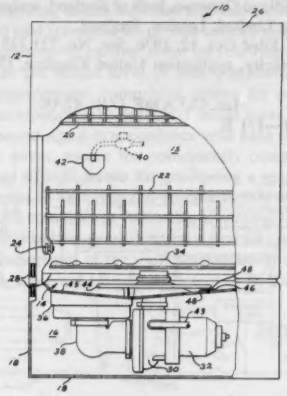
4,096,872

HEAT SHIELDING STRUCTURE FOR DISHWASHERS

LeRoy J. Herbst, and Thomas E. Jenkins, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 3, 1977, Ser. No. 774,208
Int. Cl.[2] B08B *3/02, 13/00*
U.S. Cl. 134—105 **8 Claims**

1. In a dishwasher including a tub formed of a material subject to deformation under heat, said tub including a sloping bottom wall, and a heating element for drying article placed in said tub, said heater being in relatively close spaced relationship with a portion of said bottom wall, a heat shielding structure for preventing deformation of said bottom wall under heat from said heating element during the drying operation comprising a shallow receptacle disposed on said bottom wall



between said heater and said bottom wall for collecting a small quantity of the water employed in the washing operation.

4,096,873

IMMERSION CLEANER

Karl G. Otzen, Brookfield, Wis., assignor to Safety-Kleen Corporation, Elgin, Ill.

Filed Jun. 20, 1977, Ser. No. 808,169
Int. Cl.[2] B08B *3/04*
U.S. Cl. 134—135 **11 Claims**

1. An immersion cleaner for parts and articles comprising, in combination, a receptacle for articles, a cover unit for a container of cleaning liquid, a cam plate unit disposed on said cover and including a circumferentially extending cam track surface having axially undulating portions, a combination receptacle support and cam follower unit having a vertical axis of rotation and being disposed in use above said cam plate, said receptacle support unit including means adapted to engage said cam track and to ride thereover upon oscillation of said support unit about said axis thereof, means attached to a portion of said support unit for forming an operative connection between said receptacle and said support unit, said connecting means extending through a portion of said cover, means on said support unit for receiving a driving force for oscillating said support unit about said axis, and means for securing said cover unit

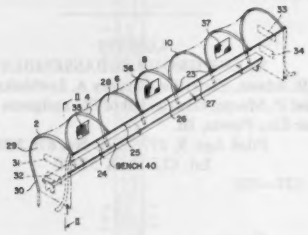
to a container for a cleaning liquid, said securing means being adapted to permit closing of said cover unit to prevent escape of the contents therefrom and to permit opening said cover unit for access to said receptacle and to the interior of said cleaning liquid container.

4,096,874

WEATHER SHELTER

Mark G. Weatherly, Lynchburg, Va., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 8, 1977, Ser. No. 785,743
Int. Cl.[2] E04F *10/04*
U.S. Cl. 135—5 R **3 Claims**



1. A disassembleable and portable weather shelter, comprising

a plurality of like shelter supports equidistantly horizontally spaced in parallel vertical planes, each support consisting of a curved elongated unit having a central section resembling the letter C, said section having a lower end portion which extends vertically below said section and terminating in a bottom pointed end, each section having an upper end portion shorter than the lower end portion and extending upwards and outwards to form a stub, each of said supports including two curved hollow tubes, one slidable and adjustably positioned within the other;

a plurality of elongated connector members, the number of connector members being one less than the number of supports, each of said connector members having spaced opposite ends and being connected at each end to a stub of a corresponding one of a corresponding pair of next-adjacent supports and extending horizontally therebetween, the combination of supports and connector members defining a frame; and

a flexible waterproof cover applied over the frame and secured thereto, said cover having an opening extending vertically from the stubs to the lower end portions and extending horizontally along the entire frame and including end parts extending next-adjacent the supports at the opposite ends of said plurality of supports, each of the end parts having screened cutouts formed therein and flaps for selectively covering said cutouts.

4,096,875

PRESSURE FLUID-ACTUATED OSCILLATOR

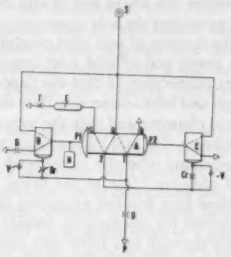
Norman Stewart Jones, Leighton Buzzard, and Geoffrey Richard Bennett, Linslade, both of England, assignors to Pneupac Limited, London, England

Filed Mar. 5, 1976, Ser. No. 664,185
Claims priority, application United Kingdom, Mar. 7, 1975, 9697/75
Int. Cl.[2] A61M *16/00*
U.S. Cl. 137—102 **6 Claims**

1. A pressure fluid-actuated oscillator comprising

(a) a double-piloted five-port valve including an inlet port for receiving the pressure fluid, two outlet ports and two exhaust ports;

(b) two biased timer valves respectively connected to a respective one of the outlet ports to control oscillating change-over between two part-cycles of the five-port valve, the inlet port being in communication with one of the outlet ports during each part-cycle of the oscillating change-over, and the other outlet port being in communication with a respective one of the exhaust ports during each part-cycle, and each of the timer valves being set at a timing period determining the respective part-cycle;



(c) control means for directly adjusting the timing period of one of the timer valves whereby the duration of the part-cycle of the oscillating change-over controlled by the one timer valve is directly adjusted; and

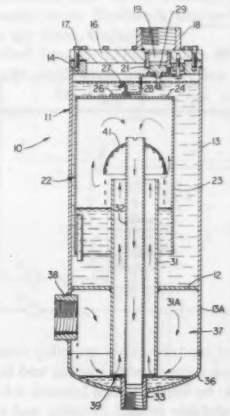
(d) means sensitive to the duration of said part-cycle for determining the timing period of the other timer valve.

4,096,876

CONDENSATE CONTROLLER

Otho E. Ulrich, Three Rivers, Mich., assignor to Armstrong Machine Works, Three Rivers, Mich.

Filed Jul. 2, 1976, Ser. No. 702,150
Int. Cl.[2] F16T *1/30*
U.S. Cl. 137—185 **5 Claims**



1. In a condensate controller comprising a casing having a bottom wall, a side wall and a top wall and defining a closed compartment, an inverted bucket vertically movable inside the compartment, a condensate discharge valve in the top wall of the compartment, valve operating means connected to said bucket for opening and closing the valve in response to the vertical position of said bucket in said compartment, an inlet conduit for vapor and condensate extending upwardly through said bottom wall into the bucket and a blow-thru conduit extending upwardly through said bottom wall into the bucket to a position above the upper end of said inlet conduit whereby vapor can continuously escape from the bucket regardless of the vertical position of the bucket in the compartment, the improvement which comprises: wall means defining a closed

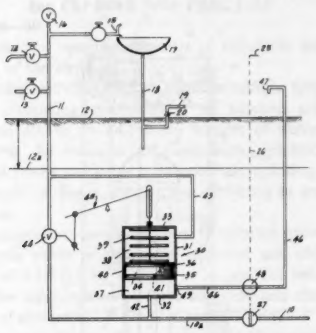
chamber connected to said casing and located below the bottom wall thereof, an inlet connection for supplying vapor and condensate into the upper end of said chamber, said chamber defining a vapor space for absorbing pressure surges in the pressure of the vapor and condensate fed into said chamber, said inlet conduit extending downwardly through said chamber to a location close to, but spaced upwardly from, the lower end of said chamber, the lower end of said inlet conduit defining an opening providing the sole communication between said chamber and the interior of said inlet conduit, said opening as defined at the lower end of said inlet conduit being located below said inlet connection so that the vapor and condensate entering through said inlet connection flow downwardly to the lower end of said chamber and then the vapor flows upwardly through said opening into said inlet conduit and carries with it portions of condensate whereby to maintain the level of condensate in said chamber close to the lower end of said inlet conduit, said blow-thru conduit extending through the lower end of said chamber for discharging outside the chamber the vapor that flows through said blow-thru conduit, and a flow-impingement plate positioned adjacent the upper end of said inlet at an elevation below the upper end of said blow-thru conduit, said plate having a lower concave surface opening downwardly and being disposed in confronting relationship to the open upper end of said inlet conduit, the lower and radially outer edge of said concave surface being disposed radially outwardly of the upper edge of said inlet conduit.

4,096,877

FREEZEPROOF SANITARY WATER SUPPLY APPLIANCE

E. R. Arledge, II, 5600 "C" St., Little Rock, Ark. 72205

Filed May 17, 1976, Ser. No. 687,327
Int. Cl.[2] E03B *9/04*
U.S. Cl. 137—281 **18 Claims**



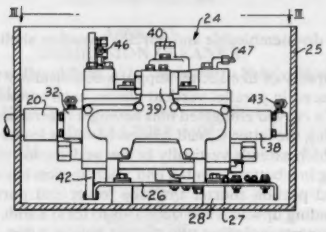
1. A freeze-proof sanitary valve assembly comprising:
a housing forming a combined cylinder and liquid reservoir and adapted to be buried in soil beneath a local frost line;
a piston means slidable in said cylinder and normally sealingly dividing said reservoir into variable first and second chambers;
bias means urging said piston means to a position minimizing the volume of said first chamber;
a pressurized water supply line selectively communicating to said first chamber;
an exposed water outlet device through which water passes to atmosphere and communicating to said second chamber;
valve means responsive to movement of the piston means for selectively communicating said supply line to said outlet device when said piston means has moved to minimize said volume of said second chamber;
said bias means being overcome by water pressure from said supply line exerted upon said piston means in opposition to the force of said bias means and permitting said movement of said piston means; and
a pump-out passage selectively communicating said first chamber to atmosphere,
whereby upon inflow of water from said supply line said piston is moved through the cylinder and reservoir against said bias means to a fully charged position, whereupon said valve means opens to permit flow of said water to said outlet device, and whereby upon termination of said flow and movement of said piston away from said fully charged position under the urging of said bias means said valve means closes, water in said first chamber is pumped therefrom through said pump-out passage by said piston in a pump-out stroke, and said stroke simultaneously draws water from said water outlet device into said second chamber.

4,096,878

VALVE GROUP SUBASSEMBLY

Stanley B. Adams, Yorkville; Gregory A. Loebbaka, Aurora, and Michael P. Morge, Oswego, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 9, 1976, Ser. No. 675,360
Int. Cl.[2] F16K *51/00*
U.S. Cl. 137—351 **10 Claims**



1. In a vehicle having hydraulically operable mechanisms, means for providing controlled delivery of hydraulic fluid from a pressurized supply to said mechanisms including a plurality of main valves and a plurality of pilot valves for controlling operation of the main valves, each of said valves having removable movable valve members, a cab, a housing carried by the vehicle remotely of the cab, and operator-controllable controls in said cab for operating said pilot valves, the improvement comprising: a unitary support; means mounting said main valves to said support; means mounting said pilot valves to said support; a manifold; means mounting said manifold to said support; interconnecting duct means hydraulically interconnecting said valves and manifold; connecting means for removably connecting said interconnecting duct means to said supply; connecting means for removably hydraulically connecting said main valves to said vehicle mechanisms; connecting means for removably hydraulically connecting said pilot valves to said controls in said vehicle cab; and means for removably mounting said support with said valves, duct means, and connecting means as a unit in said housing with said valves disposed to permit removal of said removable valve members from the valves with the valve body portion being maintained mounted to the support.

4,096,879

ADJUSTABLE FLUID FLOW REGULATOR

Juan Ricardo Serur, Brookline, and Herbert Heinz Loeffler, Arlington, both of Mass., assignors to International Biomedical Laboratories, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 715,907, Aug. 19, 1976, abandoned. This application Sep. 27, 1976, Ser. No. 726,591
Int. Cl. F16k *21/18*
U.S. Cl. 137—391 **21 Claims**

1. In a rate of flow regulator for use in a gravity assisted fluid

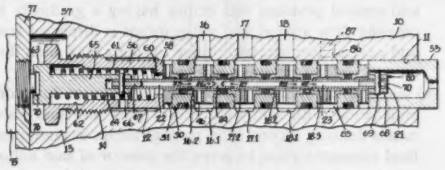
delivery system, the regulator comprising: an upper fluid chamber having a fluid inlet and a fluid outlet and further having means for maintaining a predetermined level of fluid in said upper chamber; a separate lower fluid chamber having a fluid inlet and a fluid outlet; a flexible tube connecting said fluid inlet in fluid flow communication with said upper chamber fluid outlet; and vent means for communicating atmospheric pressure to each said chamber; the improvement in which structure defining a restricted metering orifice of predetermined cross-sectional area at said lower chamber fluid inlet in the fluid flow path from said upper chamber to said lower chamber for metering fluid flow to said lower chamber, said tube connected to said metering orifice structure; the vertical distance between said lower chamber and said upper chamber is adjustable to vary the distance between said metering orifice and said predetermined level in said upper chamber whereby fluid flow rate between said chambers may be adjusted by adjusting said vertical distance.

4,096,880

CARTRIDGE VALVE

John C. Lemmon; Donald R. Olson, both of Salem, and Dean E. Zepernick, Hanoverton, all of Ohio, assignors to Hunt Valve Co., Inc., Salem, Ohio

Filed Sep. 15, 1976, Ser. No. 723,320
Int. Cl.[2] F16K *3/26*
U.S. Cl. 137—454.2 **16 Claims**



1. A fluid control valve, comprising:

a valve body having a bore, and a plurality of lateral ports spaced-apart in a direction axially of said bore and each communicating therewith,

a cartridge comprising an axially reciprocable, cylinderical valve plunger, a plurality of similar separators and a plurality of similar glands surrounding said plunger in predetermined sequence axially of the latter,

said glands each being of an external diameter to closely but slidably fit within said body bore and carrying sealing means on an exterior surface to seal against fluid flow along said bore, each of said glands having a circular opening of a diameter larger than the external diameter of said valve plunger,

said separators each having a head portion of a diameter smaller than said body bore but larger than the opening in a gland, and each having a stem portion adapted to closely but slidably fit within an end of a gland opening,

each separator having a circular opening of a larger diameter than the external diameter of said valve plunger, such opening extending from the side face at said head portion toward but short of the opposite side face at said stem portion and merging thereat with a smaller diameter portion which closely but slidably fits over said valve plunger,

said separators and said glands being arranged in sequence on said valve plunger and stationary within said body bore with a pair of separator head portions on opposite side faces of a respective one of said glands and with side faces of adjoining head portions in abutment, said stem portions of the separators on opposite sides of a gland closely but slidably fitting within opposite ends of a respective gland opening, the end faces of such stem portions being held from abutment to provide an annular space therebetween, and a seal within each such space to seal against fluid flow along the exterior surface of said plunger,

said separator circular openings providing annular chambers about said valve plunger, which chambers are separated axially along said plunger and which communicate with respective ports of said valve body, and

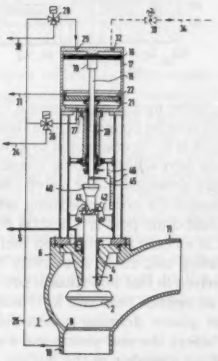
said valve plunger being hollow and having radial ports cooperable with said seperator chambers to regulate flow of fluid between said valve body ports.

4,096,881

NUCLEAR-REACTOR STEAM-GENERATOR SHUT-OFF VALVE

Hans-Peter Schabert, and Erwin Laurer, both of Erlangen, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Germany

Filed Jun. 26, 1975, Ser. No. 590,674
Claims priority, application Germany, Sep. 26, 1974, 2446044
Int. Cl. F16k *31/122*
U.S. Cl. 137—492 **9 Claims**



1. A fast acting valve for use in the live steam line of a nuclear reactor installation, which steam line leads from a containment to outside thereof, comprising:

a. a valve housing having a valve seat with an aperture corresponding to the diameter of the live steam line;

b. a valve disc adapted for reciprocal motion with respect to said valve seat to move from a position where it fully closes said aperture to a position where said aperture is fully open providing within the valve a cross section corresponding to the cross section in the live steam line,

said valve disc supported for said reciprocal motion on a valve stem;

c. a first piston and cylinder arrangement having a piston rigidly coupled to said valve stem, said piston having a range of travel at least equal to the travel of said valve disc between said fully open and fully closed positions;

d. a second piston and cylinder arrangement with a range of travel between first and second end positions less than the range between said fully opened and fully closed positions coupled to said stem such as to be moved to said first end position when said valve disc is in the fully closed position and such as to permit moving said valve disc and stem from said closed position to a first intermediate position when at its second end position;

e. means coupled to the inlet side of said valve for supplying the steam pressure therein to said first piston and cylinder arrangement when there is a leak in the steam line to move said piston and move said valve disc from a fully open to a fully closed position and thereby move said second piston to its first end position; and

f. second means coupled to said inlet and responsive to an excess pressure above normal operating pressure at said inlet to admit steam to said second piston cylinder arrangement to move said piston from said first end position to said second end position thereby opening said valve to said first intermediate position.

4,096,882

CONTROL VALVE

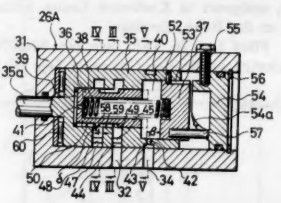
Kazuhiko Yano; Kazuhiko Otsuki, both of Nishinomiya, and Ryota Ohashi, Sakai, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Filed Dec. 20, 1976, Ser. No. 752,198

Claims priority, application Japan, Dec. 24, 1975, 50-155529; May 31, 1976, 51-63883; Jul. 8, 1976, 51-91567[U]

Int. Cl.[2] F15B *13/06*

U.S. Cl. 137—596.12 **11 Claims**



1. A control valve means comprising a valve case having an inlet port which is to be connected to a fluid pump, at least one outlet port which is to be connected to a fluid operated means, and a fluid drain port which is to be connected to a fluid tank; a rotor rotatably arranged in the valve case which rotor provides fluid passages for communicating said outlet port selectively to said fluid drain port at a neutral position thereof or to said inlet port at an operation position thereof; and a handling means for rotating said rotor selectively to one of said positions, characterized in that said rotor is provided with a hollow space having an opened rear end in which space are slidably inserted a first piston defining a first fluid chamber in the hollow space before the said piston and a second piston defining a second fluid chamber in the hollow space between said pistons, said first piston further defining a fluid passage for communicating said inlet port to said outlet port within said hollow space outside the first piston, and said first fluid chamber being communicated to said outlet port through a fluid passage formed between the rotor and first piston at said operation position of the rotor, said first and second fluid chambers being in communication to each other through a throttled fluid passage formed in the first piston, and said second fluid chamber being communicated to said fluid drain port through a fluid drain passage formed in the rotor; a compression spring provided between said first and second pistons for biasing the pistons to move apart from each other, said spring being compressed with an advance of the second piston so that force applied to the first piston by such spring is enlarged; said first piston being provided at the periphery thereof with a blocking portion which blocks said fluid passage for communicating the inlet port to the outlet port at said operation position of the rotor when the first piston has been retreated by a predetermined distance; and means for advancing said second piston by a selected distance.

4,096,883

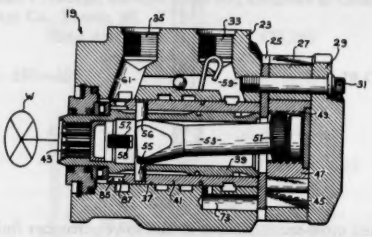
CLOSED-CENTER CONTROLLER AND NEUTRAL BYPASS ARRANGEMENT THEREFOR

James K. Yip, Richfield, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 24, 1976, Ser. No. 717,735

Int. Cl.[2] B62D *5/08*

U.S. Cl. 137—596.13 **9 Claims**



1. A closed-center controller for fluid pressure operated devices, said controller comprising:

(a) a housing having a fluid inlet port, a fluid return port adapted to be connected to reservoir, and a pair of control fluid ports adapted for connection to a fluid pressure operated device;

(b) valve means disposed within said housing and defining a neutral position, said valve means including a generally cylindrical, hollow valve member;

(c) said housing defining inlet passage means in fluid communication with said fluid inlet port and said valve means defining first fluid passage means in continuous fluid communication with said inlet passage means, said first fluid passage means being disposed toward an axial end of said valve means;

(d) said valve means defining a variable, main flow control orifice having a zero flow area when said valve means is in said neutral position, said orifice having a gradually increasing flow area as said valve means is displaced from said neutral position, said orifice having a maximum flow area capable of passing a maximum system flow;

(e) said housing defining return passage means in fluid communication with said fluid return port and said valve means defining second fluid passage means in continuous fluid communication between the interior of said hollow valve member, toward the opposite axial end thereof, and said return passage means;

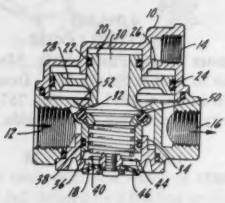
(f) said valve means defining bypass passage means communicating between said first fluid passage means and the interior of said hollow valve member, toward said one axial end thereof, said bypass passage means including a variable bypass orifice having a flow area which is a maximum when said valve means is in said neutral position and progressively decreasing toward zero as said valve means is displaced from said neutral position; and

(g) said bypass passage means, when said bypass orifice is at a maximum flow area, being capable of passing not more than about five percent of said maximum system flow.

4,096,884
RELAY VALVE

Charles Horowitz, Niles, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Dec. 20, 1976, Ser. No. 752,131
Int. Cl.[2] F16K 11/16
U.S. Cl. 137—627.5 8 Claims



1. A relay valve for use in vehicle air brake systems including a housing having a service port, a supply port, at least one delivery port, and an exhaust port, a piston movable in said housing in response to pressure at said service port to control communication between said supply and delivery ports, a shuttle movable in said housing to control communication between said exhaust and delivery ports,

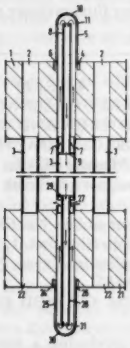
said shuttle having a groove and a seal positioned in said shuttle groove, sealing surfaces on said piston and housing, spring means urging said shuttle seal into sealing engagement with said piston and housing sealing surfaces thereby closing communication between said supply and delivery ports and between exhaust and delivery ports,

and vent means connecting said shuttle seal groove and said exhaust port, to prevent pressure buildup behind said shuttle seal.

4,096,885
METHOD FOR SEALING LEAKING PIPES AND REPAIR UNIT FOR USE IN THE METHOD

Jan Essebaggers, Nieuwerkerk aan de IJssel, Netherlands, assignor to B.V. Neratoom, The Hague, 's-Gravenhage

Filed Feb. 2, 1976, Ser. No. 654,398
Claims priority, application Netherlands, Feb. 5, 1975, 7501372
Int. Cl.[2] F16L 55/18; F28F 11/00
U.S. Cl. 138—97 5 Claims



1. A method for sealing off a leaking pipe in a bundle of pipes having first and second open ends terminating, respectively, in spaced apart first and second header plates of an apparatus adapted to transfer heat between a fluid flowing through the pipes from the outer side of one header plate to the outer side of the other header plate and a liquid flowing through the space surrounding the pipes between the inner sides of the header plates, the method including severing the leaking pipe adjacent to the inner side of the first header plate to permit liquid to enter the pipe from said surrounding space and to prevent thermal stresses in the pipe, and sealing the openings to the first and second ends of the pipe with first and second closure members from the outer sides of the first and second header plates, respectively, wherein the improvement comprises:

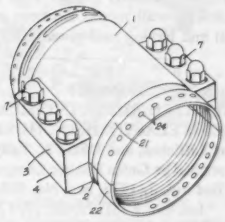
making at least one opening through the wall of said leaking pipe adjacent to the inner side of the second header plate to permit liquid to flow between the surrounding space and the pipe interior at the at least one opening and

longitudinally dividing the interior of the pipe at said first and second ends into first flow paths connecting the interior of the pipe inward of the severed portion and the at least one opening with the inner sides of the first and second closure members, respectively, and second flow paths between the inner sides of the first and second closure members, and the severed portion and the at least one opening in the pipe wall, respectively, such that liquid passing through the severed portion and the at least one opening through the pipe wall will traverse the entire length of the pipe and flow past the inner faces of the first and second closure members, thereby avoiding any region of stagnant liquid adjacent to the closure members.

4,096,886
CLAMP FOR REPAIR OF LEAKING UNDERWATER PIPELINES

Ronald Albert Daspit, 2401 Delille St., Chalmette, La. 70043

Filed May 2, 1977, Ser. No. 784,340
Int. Cl.[2] F16L 55/16
U.S. Cl. 138—99 1 Claim



1. A clamp for repair of leaking underwater pipelines employing two matching semicircular segments with longitudinal flanges on each segment and fastening means passing through apertures in said segments to secure them together, aligning slots in each opposing faces of the segments, elongated seals in said slots, annular seals at the ends of the segments, adapted to seal the clamp against leakage from the pipe on which it is mounted and circular grooves adjacent the ends of the clamp, externally thereof, a shroud spaced from the circular grooves and extending to the end of the clamp at each end thereof, a plurality of ribs supporting the shroud to the clamp, and a plurality of apertures spaced about the periphery of the shroud for passage of liquid therethrough.

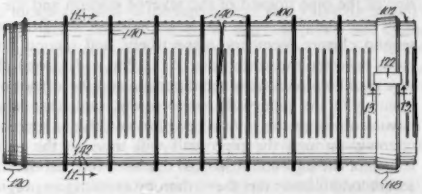
4,096,887
MULTIBORE CONDUIT

Kenneth F. Streit, Mt. Prospect, Ill., assignor to Phone-Ducs, Inc., West Chicago, Ill.

Filed Jul. 28, 1976, Ser. No. 709,491
Int. Cl.[2] F16L 9/22
U.S. Cl. 138—117 8 Claims

1. An elongated lightweight injection molded plastic conduit section with male and female ends comprising: an enclosing wall means of given thickness having first and second pairs of generally flat parallel walls having adjacent ends intercon-

nected by integral radial portions to define an elongated smooth surfaced, generally planar rectangular passage therein with partition wall means integral with said enclosing wall means to divide said passage into a plurality of elongated passageways, a plurality of longitudinally spaced transversely continuous reinforcing ribs extending outwardly from a peripheral surface of said enclosing wall means, said ribs extending completely around the periphery of said enclosing wall means, a plurality of transversely extending ridges extending outwardly from the peripheral surface each of said parallel walls, said ridges being spaced from one another and from said ribs and said ridges being parallel to said ribs and to one another with at least two elongated ridges on each wall between adjacent pairs of ribs, said ridges each having an elongated dimension less than the dimension between opposite edges of an associated wall with all of said ridges terminating in common planes extending generally parallel to said passageways and spaced from said radial portions, each of said ridges having a substantially constant height and cross-section throughout a major portion of the length thereof, each of said ribs having a constant height throughtout the length thereof with the height of said ribs being substantially greater than the height of said ridges, the enclosing wall means between said ribs and said ridges being flat and having said given thickness dimension.



4,096,888

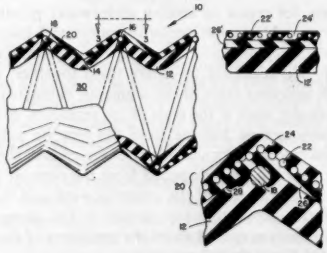
HALOGENATED BUTYL INTERLAYER FOR REINFORCED ELASTOMERIC HOSE ARTICLES

Gene E. Stefano, Littleton, and David N. Tally, Arvada, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Jul. 7, 1975, Ser. No. 593,591

Int. Cl.[2] F16L *11/08, 11/12*

U.S. Cl. 138—125 **12 Claims**



1. A unitary reinforced vulcanized elastomeric hose article for conveying fluids including an inner tube and outer cover which are composed of dissimilar polymers not readily bondable to one another comprising:

an inner heat setting elastomeric tube of a given permeability to the conveyed fluids and composed of a terpolymer of mixed mono-olefins and polyolefins;

an outer heat setting elastomeric cover;

a reinforcement embedded within the hose article and telescoped over and free from contact with the inner tube; and

an elastomeric tie gum layer of a heat setting halogenated butyl interposed between and mutually securely bonded to each of said inner tube and outer cover;

said tie gum layer exhibiting a substantially lower permeability to the conveying fluids than said given permeability to thereby provide an internal fluid barrier for the hose article and protection to the embedded reinforcement.

4,096,889

WEAVING LOOM

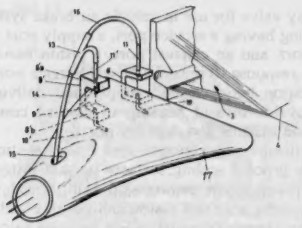
Adrianus Johannes Franciscus Larmit, Moergestel, Netherlands, assignor to Ruti-te Strake B.V., Deurne, Netherlands

Filed Jan. 6, 1977, Ser. No. 757,234

Claims priority, application Netherlands, May 31, 1976, 7605882

Int. Cl.[2] D03D *47/28*

U.S. Cl. 139—435 **5 Claims**



1. A loom comprising two sheets of warp threads which are momentarily held in diverging planes to form a weaving shed with a conveying tunnel for wefts, a blowing nozzle arranged in position at one side of such shed to propel wefts through such shed by means of a fluid discharged from said nozzle, and a main tensioning device arranged in position at the other side of such shed, operating with a fluid jet, to tension inserted wefts during the heating up movement of the loom, wherein the improvement comprises so arranging the jet that the jet issues substantially, transversely, and freely across the conveying tunnel to suck in the weft and is caught by a passage disposed in alignment with said jet, and an auxiliary tensioning device similar to the main tensioning device is provided at the main tensioning device, the main and auxiliary tensioning devices being used for normal and startup operations, respectively, and each having fluid pressure supply means for normal or startup operation.

4,096,890

WOVEN FABRIC UTILIZING A PARTICULAR TEXTURED YARN AND METHOD FOR MANUFACTURING THE SAME

Haruhiko Kusakabe; Masashi Makita, and Masutoshi Ueda, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 630,753, Nov. 10, 1975, abandoned. This application Jun. 1, 1977, Ser. No. 802,523

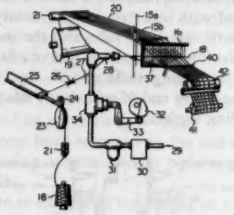
Claims priority, application Japan, Nov. 12, 1974, 49-129556; Nov. 12, 1974, 49-129557

Int. Cl.[2] D03D *47/28*

U.S. Cl. 139—435 **5 Claims**

1. A process for producing a woven fabric from a false twisted, multifilament yarn by means of a power loom provided with healds and a reed, which comprises a first step of preparing an interlaced yarn for utilization as warp from a false twisted multifilament yarn made from a multifilament yarn without twist, in such a condition that the degree of interlacing of said inter laced multifilament yarn (CF value) is in a range between 100 and 260, a second step of carrying out a weaving operation by using said interlaced yarn without sizing as the warp by means of a power loom in such a condition that an

average tension applied to said warp is in a range between 0.1 and 1.0 g/d, and each said warp contains water in at least 30



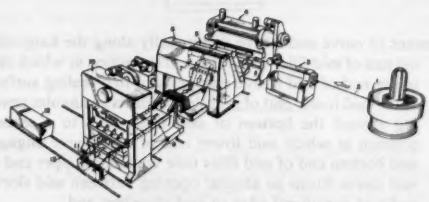
weight percent of said warp in a weaving zone between said healds and a cloth-fell defined by a beating motion of said reed.

4,096,891

METHOD AND APPARATUS FOR AUTOMATICALLY FORMING WIRE FRAMES

Katsuyasu Suzuki, Aichi; Yoshitoshi Morita, and Motoo Morita, both of Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Morita Iron Works Co., Ltd., both of Japan

Filed Jun. 8, 1977, Ser. No. 804,811
Claims priority, application Japan, Dec. 10, 1976, 52-149052
Int. Cl.[2] B21F *1/00, 21/00, 45/00*
U.S. Cl. 140—1 **2 Claims**



2. A production line for automatically forming wire frames comprising:

a wire reel stand for holding wire stock rolled on a reel;

a wire straightening machine located adjacent said wire reel stand which straightens the wire stock unrolled from said wire reel stand;

a location stamping press provided adjacent to a wire stock exit side of said wire straightening machine in a direction of the wire stock for cutting the advancing wire stock into prescribed lengths and forming ripples in the cut wire stock sections and ejecting the rippled cut wire stock sections in a lateral direction;

a press bender auto loader located adjacent to the wire stock ejection side of the location stamping press for gathering a prescribed number of rippled cut wire stock sections ejected from the location stamping press and intermittently feeding them to a next process;

a press bender provided adjacent the press bender auto loader which receives the intermittently fed rippled cut wire stock sections from the press bender auto loader and which simultaneously bends a prescribed number of wire stock sections received from the press bender auto loader in the same plane as the ripples;

a press bender unloader which removes the wire stock sections from the press bender after the completion of the pressing;

a wire stock separating device which pools the wire stock sections which have been removed from the press bender unloader and conveys them singly onwardly at prescribed intervals;

a three-dimensional bending press which receives the singly conveyed separated wire stock sections and which presses a three-dimensional bend into each of the wire stock sections; and

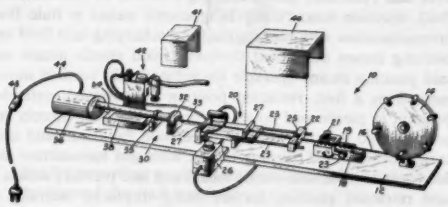
a three-dimensional bending press auto loader which is provided between the wire stock separating device and the three-dimensional bending press for loading the wire stock sections from the wire stock separating device into the three-dimensional bending press at one time, said three-dimensional bending press auto unloader further including an unloader arm which simultaneously ejects the wire stock sections which have been bent by the three-dimensional bending press.

4,096,892

RIGID COAXIAL CABLE CUTTING AND SCORING MACHINE

Humberto F. Guevara, New Haven, and Michael R. Geimer, Fort Wayne, both of Ind., assignors to International Telephone & Telegraph Corporation, Nutley, N.J.

Filed Feb. 28, 1977, Ser. No. 773,367
Int. Cl.[2] B21F *11/00*
U.S. Cl. 140—140 **4 Claims**



1. A device for cutting and/or scoring variable precision lengths of variable diameter tubular materials, particularly rigid or semi-rigid coaxial cable and small diameter tubing, including:

supply means for holding a continuous length of said tubular material;

adjustable diameter means for straightening said material;

feeding means for drawing an adjustably predetermined length of said material from said supply means through said straightening means and for advancing and guiding said straightened predetermined length of said material;

means for positioning said predetermined length of straightened material in means for cutting and/or scoring said material;

additional means associated with said cutting and/or scoring means for scoring the end of one predetermined length of said material, for cutting said material to said predetermined length and for scoring one end of the next length of said material;

said drawing means operating to cause a previously cut predetermined length of said material to advance beyond said cut and/or scoring means to cause said previously cut predetermined length of said material to advance;

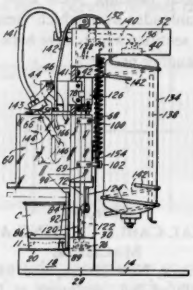
means for activating said feeding means and said cutting and/or scoring means; and

means for receiving said cut and/or scored predetermined lengths of said material.

4,096,893
SYSTEM AND APPARATUS FOR THE RECONSTITUTION OF A FOOD OR BEVERAGE CONCENTRATE

John K. Harvey, Jr., Fairfield; Morris T. Watson, Danbury, both of Conn.; Constantine F. Economy, Allentown, and Robert J. LeFevre, Bethlehem, both of Pa., assignors to American Can Company, Greenwich, Conn.

Filed Oct. 4, 1976, Ser. No. 729,033
Int. Cl.[2] B65B *3/34*
U.S. Cl. 141—90 **19 Claims**



1. A system for reconstituting food concentrates and the like comprising, a container having an open end and a food concentrate disposed therein, a pierceable and peelable cover adhered over said open end, means defining a source of reconstituting fluid, injection means comprising nozzle means in fluid flow communication with said source for discharging said fluid and piercing means connected therewith, said nozzle means and said piercing means operable for substantially vertical movement from a first, retracted position to a second, extended position to pierce said cover to form an opening therein and position said nozzle means to inject said fluid into said container through said opening to mix with and reconstitute said food concentrate, said nozzle means and said piercing means in said retracted position further being displaced laterally as respects the direction of vertical movement, mechanism for guiding said nozzle means and said piercing means between said retracted and said extended positions, means defining a source of rinsing fluid, means for directing rinsing fluid from said last recited source over said nozzle means and said piercing means upon movement thereof to said retracted position, means for positioning said container in relation to said nozzle means and said piercing means at said extended position to accommodate said piercing and said fluid injection, and means for controlling respective durations of the recited discharge of reconstituting fluid and direction of rinsing fluid in the corresponding extended and retracted positions of said injection means.

4,096,894
DUST COLLECTION DEVICE

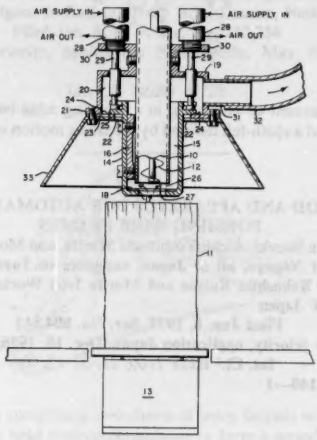
Richard Ernest Guy, Baytown, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 10, 1977, Ser. No. 823,325
Int. Cl.[2] B65B *1/28*
U.S. Cl. 141—93 **4 Claims**

1. In a container filling machine for powdered materials of the type wherein the material is dispensed into the containers through a generally vertical elongated filler tube, the improvement which comprises, in combination;

a dust collecting chamber mounted on the upper portion of said filler tube coaxial therewith and extending outwardly to form a first annular cavity between said filler tube and the inner surface of said dust collecting chamber, said chamber terminating in a peripheral edge forming an opening surrounding said filler tube, said peripheral edge having a first sealing surface thereon;

a sleeve, coaxial with and moveable along the lower portion of said filler tube, arranged to form a second annular cavity integral with said first annular cavity between the outer surface of said filler tube and the inner surface of said sleeve, the lower end of said sleeve adapted to form a second annular sealing surface with the bottom of said filler tube, the upper end of said sleeve adapted to engage said first sealing surface;



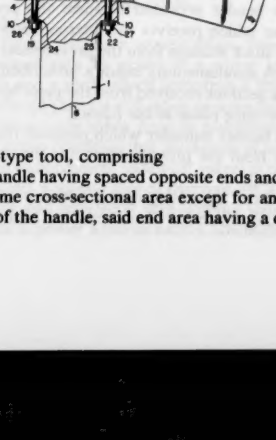
means to move said sleeve reciprocally along the longitudinal axis of said filler tube from a first position at which said upper end of said sleeve engages said first sealing surface while said lower end of said sleeve forms an annular opening around the bottom of said filler tube, to a second position at which said lower end of said sleeve engages said bottom end of said filler tube while said upper end of said sleeve forms an annular opening between said sleeve and said peripheral edge of said chamber; and

means for pulling a partial vacuum on said first annular cavity.

4,096,895
HAMMER-TYPE TOOL

Kenneth Fernitz, Waterloo, Wis., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 7, 1977, Ser. No. 849,007
Int. Cl.[2] B25C *1/00*; B25D *1/00*
U.S. Cl. 145—29 R **1 Claim**



1. A hammer-type tool, comprising

a shaft-type handle having spaced opposite ends and substantially the same cross-sectional area except for an end area at one end of the handle, said end area having a cross-sec-

tional area different from that of the remainder of the handle in a manner whereby the end area extends beyond the remainder of the handle at substantially diametrically opposite points in a pair of spaced opposite protruding portions extending substantially parallel to the axis of the handle, said end area having a pair of bores formed therethrough extending through the protruding portions in spaced relation substantially parallel to the axis of the handle, each bore opening at the opposite ends of the corresponding protruding portion;

a hammer-type head mounted on the end area of the handle and extending at substantially right angles to the axis of the handle;

a metal plate at the end of the handle at which the end area is provided, said metal plate having larger dimensions than the cross-sectional area of the end area so that it overlaps the head for a predetermined border area extending beyond said end area, and having a pair of holes formed therethrough coinciding with the bores through the protruding portions of said end area;

a pair of elongated screws each extending through a corresponding bore through the end area and a corresponding hole through the metal plate, each of the screws having a pair of spaced opposite ends with a head at one end;

a pair of lock washers each on a corresponding one of the screws at the other end thereof where it extends beyond the end area; and

a pair of nuts each affixed to a corresponding one of the screws at the other end thereof, over the corresponding lock washer.

4,096,896

COMPOSITE TOOL STRUCTURE

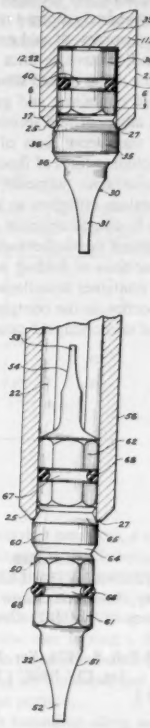
Paul Richard Engel, Rochester, N.Y., assignor to Upson Tools, Inc., Rochester, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,250
Int. Cl.[2] B25B *15/00*
U.S. Cl. 145—50 B **9 Claims**

1. A tool receiving device having at least one openend, axially extending opening of polygonal cross-section with a plurality of longitudinally straight surfaces, comprising in combination:

a tool member comprising at least three axially coextensive portions including a first portion having a cross-section conforming generally to that of the polygonal opening and insertable therein and a generally intermediate annular recess, a second portion having a cross-section different from and dimensionally larger than that of the first portion, a facing surface contiguous to the first portion for limiting the extent of insertion of the first portion into the opening, and a second facing surface spaced from the first facing surface, and a third portion extending from the second facing surface and having a tool configuration at the free end thereof; and

an elastomeric ring arranged in the recess and having an outer diameter dimensionally greater than that of the polygonal cross-section of the first portion and of the second portion for frictionally engaging the respective straight surfaces of the opening when the first portion is inserted therein to retain the tool member in the opening



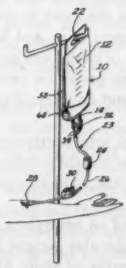
and for providing an optimum torque transfer between the device and the tool member.

4,096,897

MOLDED COLLAPSIBLE SOLUTION CONTAINER HAVING TRANSVERSE FOLD LINES

Frank Cammarata, III, Wheeling, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 670,306, Mar. 25, 1976, abandoned, which is a division of Ser. No. 526,037, Nov. 21, 1974, abandoned. This application May 27, 1977, Ser. No. 801,494
Int. Cl.[2] B65D *1/02*
U.S. Cl. 150—0.5 **7 Claims**



1. In a collapsible solution container, which container defines a body portion having an integral neck portion and a semi-rigid shoulder portion at one end thereof, and is sealed at

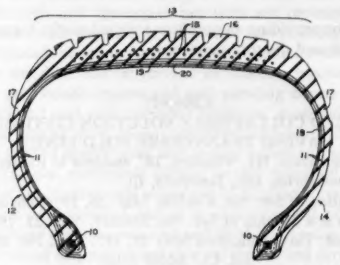
its end opposite said one end, said body portion defining, in its original, unstressed state, generally oval, transverse cross sections adjacent said neck and shoulder portions, said cross sections tapering progressively along a major portion of its length to a flat, sealed end portion at said end of the container opposite to said one end; transverse lines of folding weakness defined along opposite edges of said shoulder portion to facilitate the collapse of said container, and gusset portions defined in said body portion adjacent said shoulder portion and adjacent the ends of said transverse lines of folding weakness, said gusset portions including lines of flexing weakness to facilitate collapse of the container adjacent said shoulder portion, whereby said container collapses to a uniform flat configuration progressively from said opposite end toward said one end as the contents thereof are withdrawn through said neck portion, the transverse lines of folding weakness and gusset portions causing said container to collapse about the inner surface of said shoulder portion as the container empties, whereby the residual volume of said collapsed container is minimal.

4,096,898

INTERNAL TIRE LUBRICANT

James W. Messerly, Stow, and James J. Shipman, Akron, both of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

Filed Feb. 9, 1976, Ser. No. 656,450
Int. Cl.[2] B60C *17/00*
U.S. Cl. 152—330 L 1 Claim



1. A radial cord tubeless pneumatic tire having an essentially inextensible belt under the tread to restrict the circumference and produce a low aspect ratio, and having an air-impervious liner layer and a layer of closed cell cellular rubber the cells of which contain nitrogen gas under pressure covering at least a portion of the liner, and an internal coating consisting essentially of a mixture of:

(a) 100 parts of a soft solid partly-crystalline polyethylene of average molecular weight between about 1000 and 5000, a density of about 0.88, which becomes liquid at about 85° C, and

(b) about 35 parts of an amorphous noncrystallizable polypropylene of molecular weight about 900 which has a softening temperature of about 82° to 95° C,

the layer of closed cell cellular rubber and the internal coating extending across the entire inner surface of the crown region including the shoulder zones on which the weight of the vehicle rests when the tire goes flat.

4,096,899

LIGHT WEIGHT PNEUMATIC TIRE HAVING A THIN SIDE WALL RUBBER

Yoichi Kitazawa, Kodaira; Takeshi Sato, Higashi-Yamato, and Hisao Tsuji, Akigawa, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Sep. 3, 1976, Ser. No. 720,294
Claims priority, application Japan, Sep. 18, 1975, 50-112066
Int. Cl.[2] B60C *9/06*
U.S. Cl. 152—354 R 11 Claims

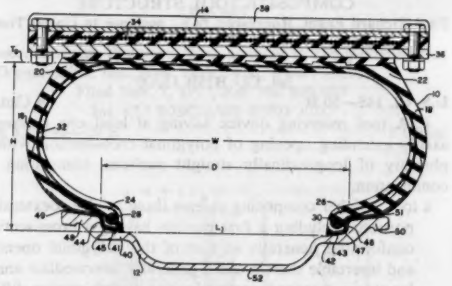
1. A light weight pneumatic tire having a thin sidewall rubber, comprising a bias laid carcass ply composed of cords angularly disposed with respect to the circumferential direction of the tire and extending from one of a pair of bead portions through a crown portion to another bead portion, a breaker layer superimposed about the crown portion of said carcass ply, an upper ply disposed on said carcass ply and extending from the bead portion to at least an edge of the crown portion and maintaining an overlapping relation with the breaker layer, said upper ply being composed of cords crossed to the cords of the carcass ply symmetrically with respect to the circumferential direction of the tire, and a thin rubber layer disposed on the outer surface of said upper ply and having a thickness of 0.5 to 3.0 mm and a Shore A hardness after vulcanization of 40° to 55°.

4,096,900

EARTHMOVER TIRE AND RIM ASSEMBLY

Richard J. Olsen, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 5, 1976, Ser. No. 646,717
Int. Cl.[2] B60C *9/02, 15/00*
U.S. Cl. 152—354 R 10 Claims



1. A tire and rim assembly for use on earthmovers in which (A) the tire comprises a tread portion, a pair of sidewall portions, a pair of annular bead portions and a carcass structure extending circumferentially around said tire and from one bead portion to the other bead portion, each said bead portion having an annular inextensible bead core, a bead seat surface disposed radially inwardly of the annular bead core, a bead register surface extending radially outwardly of the axially outer edge of the bead seat surface and a flange contact surface extending axially outwardly of the radially outer end of the bead register surface, (B) the rim is of the drop center type and

having a bead seat in engagement with the bead seat surface of the tire, a flange register in contact with the flange register surface of the tire and a stabilizer flange being substantially straight throughout its axial extent and disposed at an angle of less than 10° with respect to the rotational axis of the tire and extending axially outward of the radially outer edge of the bead register for a distance equal to at least 10% of the maximum axial width of said tire when mounted on the rim and inflated, (C) said assembly being characterized by the flange contact surface of the tire being in contact with the stabilizer flange for a distance equal to at least 10% of the section width of the carcass structure and the distance between the contact surface of the flange and the carcass structure decreasing from a maximum at the axially outer extremity of the contact surface to a minimum adjacent the bead register surface to provide a preloading on said flange when said tire is inflated.

4,096,901

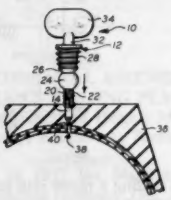
TIRE PLUG FOR TUBELESS TIRES

William Reichenbach, 238 Java St., Brooklyn, N.Y. 11222

Continuation-in-part of Ser. No. 634,586, Nov. 24, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,740

Int. Cl.² B60C *21/00*

U.S. Cl. 152—370 **10 Claims**



1. A tire plug for insertion into the puncture of a tubeless tire, said plug comprising:

(a) a rigid body member having a plurality of integrally formed portions extending longitudinally of said member, said portions comprising:

(1) a pointed entrant portion located at one end of the body member;

(2) a severable finger gripping portion located at the opposite end of said member, said finger gripping portion providing the sole leverage for threaded insertion of said plug into the tire without the need of any separate tool;

(3) a tapered threaded portion located between said entrant portion and said gripping portion; and

(4) a fracturable stem portion connecting said gripping portion to said tapered portion;

(b) said entrant portion having a smooth surface extending from the pointed end in the direction toward said tapered portion to facilitate initial sliding insertion of said plug into the puncture of said tire to a position to support itself for threaded insertion therein;

(c) the diameter of said tapered threaded portion increasing in the direction toward said gripping portion for exerting an increasingly compressive force on the tire material of the wall defining the puncture to seal said puncture upon threaded insertion of said plug; and

(d) said stem portion fracturing in response to a predetermined force; whereby said gripping portion is severed from said body member after the puncture has been sealed.

4,096,902

DOOR WITH FLEXIBLE WOUND SECTIONS

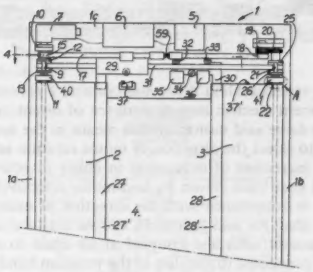
Louis Junod, 78, rue des Moulins, 1400 Yverdon, Switzerland

Filed Jun. 11, 1976, Ser. No. 694,946

Claims priority, application Switzerland, Jun. 13, 1975, 7682/75

Int. Cl.² E06B *9/08*

U.S. Cl. 160—122 **8 Claims**



1. A door comprising;

a door frame having two side members, a top member and a bottom member jointly generally defining a vertical plane;

a pair of flexible door sections, aligned with one another in said plane, each section having a vertical winding tube rotatably mounted and extending along one of the sides of the frame, each section also having a first vertical edge portion secured to the respective winding tube so that the section can be wound on the tube, and having a second and free vertical edge portion;

two rigid uprights each extending along and secured to the free vertical edge portion of one of the flexible door sections;

a mounting, driving and synchronizing system for the two uprights, comprising (a) an upper toothed belt disposed adjacent and along the top of the frame and fixed to upper ends of the two uprights, the belt being movable to synchronously move the upper ends in mutually opposite directions in said plane, and a lower toothed belt disposed adjacent and along the bottom of the frame, fixed to lower ends of the two uprights, and movable to similarly move the lower ends, (b) a driving shaft rotatably mounted at the top and bottom of the frame, extending through and supporting one of the winding tubes, and having upper and lower drive wheels secured to the shaft near upper and lower ends, respectively, of the winding tube supported by the shaft, for driving the upper and lower toothed belts, (c) a driven shaft and drive wheel means similarly mounted and having means for driving them by the belts; and (d) motor means for reversibly rotating the driving shaft;

two carriages, one secured to the upper end of each upright and each secured to the upper toothed belt;

rail means for supporting and guiding the carriages to keep the flexible door sections in said vertical plane, and

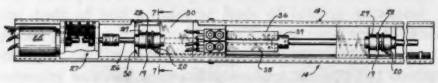
a pair of elastic biasing couplings, each interposed and acting between one of the shafts and the respective winding tube for biasing the respective tube and first vertical edge portion towards winding said portion and the respective door section onto the tube to keep the flexible door sections flat in said vertical plane while the uprights and free edge portions are reversibly driven by the motor, drive shaft and belts toward the sides of the frame, and while the door sections are held in resulting positions.

4,096,903

POWER DRIVE FOR A VENETIAN BLIND

John Ringle, III, 1410 Fairmont St., Wausau, Wis. 54401

Continuation-in-part of Ser. No. 485,820, Jul. 5, 1974, abandoned, which is a continuation of Ser. No. 307,979, Nov. 20, 1972, abandoned. This application Sep. 8, 1975, Ser. No. 611,015
Int. Cl.[2] E06B *9/26*
U.S. Cl. 160—176 R 6 Claims



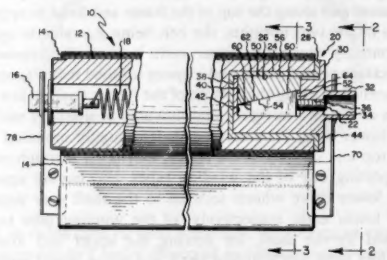
1. In a venetian blind drive and control, a reversible rotary direct current electric motor, a source of direct current connected to drive said motor, switch means in the motor circuit operable to select the direction of motor rotation and to determine the increment of movement in either direction, a speed reduction gear train driven by said motor selectively in either direction in accordance with the direction of motor rotation, an output shaft for said gear train, a cross shaft for said blind in axial alignment with and coupled at all times to said output shaft and connected to the slats of the venetian blind to provide a predetermined tilt adjustment for the latter between predetermined opposite closure positions by a partial revolution of said cross shaft, a separate limit switch connected directly in a branch of the power circuit of said motor for each direction of operation of the motor, and separate abutment means generally carried by and rotatable with at least one of said shafts to actuate corresponding of said limit switches to open the motor circuit and stop said motor upon said shafts reaching a limit of rotation corresponding to a predetermined position of blind operation in either of the selected directions.

4,096,904

ROLLER SHADE BRAKING MECHANISM

John D. Donofrio, Ogdensburg, N.Y., assignor to Joanna Western Mills Company, Chicago, Ill.

Filed Aug. 29, 1977, Ser. No. 828,949
Int. Cl.[2] E06B *9/208*
U.S. Cl. 160—299 9 Claims



1. An improved roller shade of the type having an axially elongated barrel adapted to receive a shade wound thereabout, said elongated barrel having an internally mounted motor for urging said barrel to rotate in a shade winding direction, said barrel further including an internally mounted braking mechanism for resisting rotation of said barrel, said braking mechanism comprising a hollow brake drum with an internally disposed braking mechanism having first and second oppositely directed brake shoes, said brake shoes each having an outside surface adapted for frictional engagement with the interior surface of said brake drum, wherein the improvement comprising:

(a.) said first and second brake shoes having opposed inwardly facing surfaces forming an axially tapering cavity;

(b.) an axially moveable means adapted to be inserted in said cavity and adapted to engage said opposed inwardly facing surfaces for causing said first and second brake shoes to be urged laterally outwardly proportional to the axial position of said axially moveable means; and

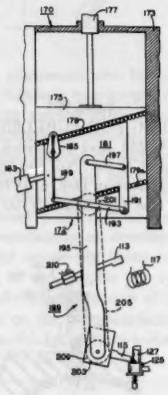
(c.) means operatively engaging said axially moveable means for axially and adjustably positioning said axially moveable means.

4,096,905

METHOD OF INTRODUCING HARDENABLE MATERIAL INTO CONTAINING MEANS THEREFOR

Jesse A. Stoner, Scotia, N.Y., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 490,257, Jul. 22, 1974, Pat. No. 3,979,032, which is a division of Ser. No. 397,425, Sep. 14, 1973, Pat. No. 3,974,873. This application Oct. 14, 1975, Ser. No. 622,030
Int. Cl.[2] B22D *19/04*
U.S. Cl. 164—51 21 Claims



1. A method of casting a metal into means for containing it comprising the steps of:

(a) supplying the metal in its solid state to a receptacle therefor;

(b) transferring the metal in its solid state from the receptacle into means for casting the metal disposed in a first position generally adjacent the receptacle;

(c) displacing the casting means with the metal in its solid state therein from the first position to a second position for heating the metal and melting the metal in the casting means at the second position;

(d) moving the casting means from the second position to a position generally adjacent the containing means for casting the molten metal from the casting means into the containing means; and

(e) casting the metal from the casting means into the containing means.

4,096,906

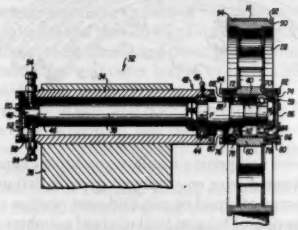
CASTING MACHINE WITH MULTI-BAND POSITIONING DEVICE

Yves Bernard Bonnamour, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Division of Ser. No. 612,216, Sep. 10, 1975, Pat. No. 3,991,814. This application Aug. 30, 1976, Ser. No. 718,497
The portion of the term of this patent subsequent to Nov. 16, 1993, has been disclaimed.
Int. Cl.[2] B22D *11/06*
U.S. Cl. 164—433 5 Claims

1. In a casting machine for continuously casting molten metal wherein a flexible endless band is guided into closed relationship with an arcuate portion of the peripheral groove of a rotatable casting wheel to form a casting mold and includ-

ing means for positioning the band over the peripheral groove of the casting wheel, said casting machine having a support frame, the improvement comprising said band positioning means including at least two band support wheels arranged on said support frame adjacent said casting wheel for supporting said endless band, said two band support wheels being rotatably mounted on shafts arranged along axes substantially parallel to the rotational axis of said casting wheel, axial motion means operatively connected to each of said band support



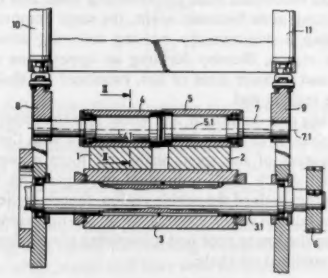
wheels for independently moving each band support wheel along a line of motion substantially parallel to its axis of rotation, and pivotal motion means axially immovably mounted relative to said support frame and operatively connected to the shaft of each of said band support wheels for independently pivoting the axis of rotation of such band support wheel about a point laterally displaced therefrom and for transmitting axial thrust applied to said shaft by said axial motion means directly to said support frame.

4,096,907

STRAND WITHDRAWAL ASSEMBLY FOR CONTINUOUS CASTING PLANTS

Heribert A. Krall, Wurzburg, and Helmut Maag, Waldbuttelbrunn, both of Germany, assignors to Technica-Guss GmbH, Wurzburg, Germany

Filed Jul. 25, 1977, Ser. No. 818,688
Claims priority, application Germany, Oct. 28, 1976, 2649015
Int. Cl.[2] B22D *11/12;* B65H *17/20*
U.S. Cl. 164—448 **3 Claims**



1. A strand withdrawl assembly for withdrawal of strands emerging from a casting mould in a continuous casting plant, said strand withdrawal assembly comprising:

a lower roller, said lower roller being rotatably carried in said assembly and having drive means to rotate said lower roller;

at least first and second upper rollers, said upper rollers being each rotatably carried above said lower roller on a common eccentric shaft;

means rotatably supporting end portions of said eccentric shaft; and

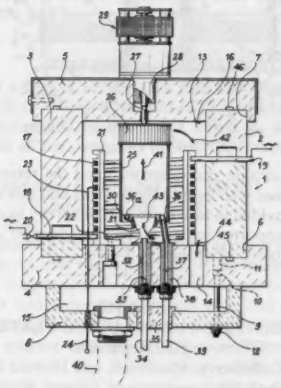
means raising and lowering said eccentric shaft to move said upper rollers into contact with the strands positioned between said upper and lower rollers for withdrawal whereby said eccentric shaft rotates in said support means to position said upper rollers to apply equal pressure to the strands positioned between said upper and lower rollers for uniform withdrawal of said strands.

4,096,908

HEATING AND COOLING ENCLOSURE FOR A GAS CHROMATOGRAPHIC COLUMN

Henri Lamy, Morlaas, France, assignor to Elf Union, Paris, France

Filed Dec. 15, 1976, Ser. No. 750,998
Claims priority, application France, Dec. 17, 1975, 75 38735
Int. Cl.[2] B01D *15/08;* G01N *31/08*
U.S. Cl. 165—64 **7 Claims**



1. A heating and cooling enclosure for a chromatographic column comprising an insulating and demountable box unit which surrounds the column and has a side wall which rests on a bottom support and is closed at the top by a lid, the column itself being constituted by a metallic tube having a constant cross-sectional area supplied with an electric heating current and wound in a helix having a vertical axis, and means for producing a circulation of air around the column within the box unit, wherein the means aforesaid comprise an open cylindrical skirt arranged coaxially within the interior of the column, a centrifugal fan placed in the axis and above the skirt so as to draw the air into said skirt and discharge the air into the spaces delimited on each side of the column between the skirt and the side wall of the insulating box unit, a nozzle also located in the axis of the column beneath the skirt, an air-injection pipe which opens into the throat of the nozzle and openings for the discharge of the injected air after circulation within the box unit in contact with the column, said openings being provided through the bottom support of said box unit.

4,096,909

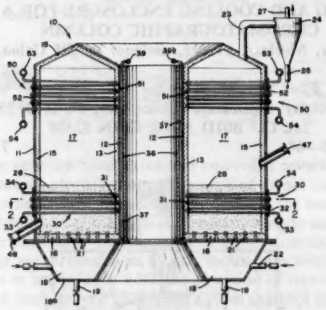
FLUIDIZED BED PROCESS HEATER

Walfred Wilhelm Jukkola, Westport, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Dec. 23, 1976, Ser. No. 754,063
Int. Cl.[2] F28D *13/00*
U.S. Cl. 165—76 **11 Claims**

10. A fluidized bed process heater comprising a vessel of toroidal configuration having an outer wall and a generally concentric inner wall, a horizontal annular constriction plate extending between said outer and inner walls and separating a heater chamber in the upper portion of said vessel from a windbox occupying the lower portion of said vessel, said constriction plate being capable of supporting a fluidized bed of particulate solids thereon, a plurality of heat exchanger coil units within said vessel each comprising horizontal runs of

tubing extending inwardly through the fluidized bed region of said heater chamber along a radius of said vessel, said horizontal runs of tubing of each of said coil units being arranged one above the other and joined at the ends thereof by vertically positioned return bends, the return bends adjacent said outer



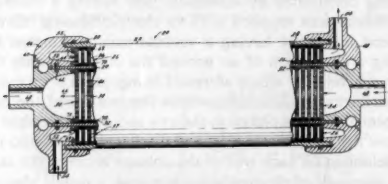
wall being outside said outer wall and the return bends adjacent said inner wall being supported in said heater chamber in recesses provided in said inner wall whereby said inner return bends are supported within said heater chamber and protected from the erosive environment therein.

4,096,910

CONCENTRIC-TUBE STACKED PLATE HEAT EXCHANGER

George A. Coffinberry, Cincinnati, and Howard B. Kast, Fairfield, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 28, 1976, Ser. No. 736,572
Int. Cl.[2] F28F *7/00*; F28D *7/10*
U.S. Cl. 165—81 **13 Claims**



1. In an apparatus for transferring heat between first and second fluids, the improvement comprising:

a first longitudinally extending annular flow passage adapted to provide a flow path for a first fluid flowing therein;

a second longitudinally extending flow passage adapted to provide a flow path for a second fluid flowing therein, said second flow passage disposed concentrically with said first annular flow passage

first tubular means for at least partially defining said first and second flow passages

a first plurality of annular heat transferring plates disposed consecutively in the longitudinal direction in said first annular flow passage and extending radially across said first annular flow passage said plates including a first set of apertures extending longitudinally therethrough and adapted to pass said first fluid

spacer means for maintaining an axial spacing between consecutively disposed plates of said first plurality of plates and for providing a radial heat conduction path

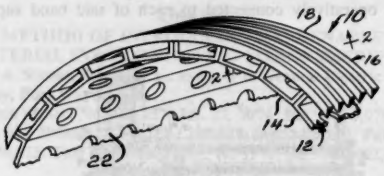
and resilient means for biasing said spacer means in the radial direction and into heat transferring engagement with said first tubular means.

4,096,911

CHANNEL BASE WELL SCREEN

Bruce R. Geske, Fridley, Minn., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 5, 1977, Ser. No. 813,047
Int. Cl.[2] E21B *43/08*
U.S. Cl. 166—234 **8 Claims**



1. A well screen comprising a hollow, multiple channel core portion and a formed wire enwrapment portion defining open slots for the passage of liquid or gas; said core portion comprising a continuous ring of longitudinal channel members, each of said channel members having a relatively wide web portion and relatively short leg portions extending radially outwardly from said web portion, said web portions being perforated and said leg portions being welded to said formed wire enwrapment at each juncture therewith.

4,096,912

METHODS FOR MINIMIZING PLASTIC FLOW OF OIL SHALE DURING IN SITU RETORTING

Arthur E. Lewis, Los Altos, and Richard G. Mallon, Livermore, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 6, 1977, Ser. No. 804,194
Int. Cl.[2] E21B *43/24, 43/26*
U.S. Cl. 166—259 **8 Claims**

1. In a method for recovering shale oil from a rubble region in a subsurface oil shale formation by in situ retorting wherein a kerogenpyrolyzing fluid is caused to flow through a retorting zone in the rubble region, thereby decomposing the kerogen and producing oil and gaseous products, product oil and product gases are recovered from the retorting zone, and the shale in the retorting zone becomes spent, the steps comprising:

establishing a downwardly moving retorting zone in the rubble region, thereby forming an upper zone of spent shale and a lower zone of hot, rubblized oil shale in the rubble region; and

introducing carbon dioxide and water into the upper zone of spent shale in amounts sufficient to react with the mineral constituents of the spent shale and form a cement-like material which binds individual shale particles together and to the walls of the rubble region, thereby relieving the weight burden of the spent shale on the hot, rubblized oil shale in the lower zone and minimizing plastic flow of said hot, rubblized oil shale.

4,096,913

HYDRAULICALLY SET LINER HANGER AND RUNNING TOOL WITH BACKUP MECHANICAL SETTING MEANS

John W. Kenneday; Charles W. Kinney; Floyd L. Scott, Jr., all of Houston, Tex., and Phillip W. Schmuck, New Orleans, La., assignors to Baker International Corporation, Orange, Calif.

Continuation-in-part of Ser. No. 758,359, Jan. 10, 1977, Pat. No. 4,060,131. This application Aug. 22, 1977, Ser. No. 826,284
Int. Cl.[2] E21B *43/10, 23/00*
U.S. Cl. 166—290 **38 Claims**

1. An apparatus for running, setting and anchoring a liner in a well bore casing, comprising: an inner longitudinally extending body; an outer longitudinally extending body around said

inner body; connecting means on one of said inner and outer bodies for connection of a liner therebelow; expander means carried on one of said inner and outer bodies; gripping means carried on the other of said inner and outer bodies and engagable with said expander means whereby said gripping means are shifted into gripping engagement with said casing; a manipulatable tubular running tool releasably secured to said inner and outer bodies; drag means mounted on said running tool slidable longitudinally along said casing; means for selective disengagement of said running tool from said inner and outer bodies; and setting means responsive to each of fluid pressure and mechanical manipulation and carried on said running tool to longitudinally shift one of said inner and outer bodies with respect to the other of said inner and outer bodies to anchor said liner to said casing, said drag means resisting longitudinal travel of said apparatus while in said well bore with sufficient frictional force to support the weight of one of said inner and outer bodies therebelow and to afford operation of said setting means during response to mechanical manipulation.

37. A method of running, setting and anchoring a liner in a well bore casing, comprising the steps of: (1) inserting within said well bore and apparatus connectible to a tubular member extendible to the top of the well thereof, said apparatus comprising: a longitudinally shiftable tubular body; expander means carried by said tubular body; lower connection means

on said tubular body for connecting the tubular body to a liner therebelow; sleeve means mounted on said tubular body and operably associatable with said tubular body upon longitudinal shifting of said tubular body with respect to said sleeve means; gripping means carried on said sleeve means engagable by said expander means and movable outwardly into gripping engagement with said well bore casing; drag means slidable longitudinally along said casing for resisting longitudinal travel of said apparatus while in said well bore with sufficient frictional force to support the weight of one of said tubular body and said sleeve means therebelow; and setting means responsive to at least one of fluid pressure and mechanical manipulation, said setting means including slot means and carriage means initially selectively engaged to said slotted member for travel within said slot means to shift said longitudinally shiftable tubular body with respect to said sleeve means to anchor said liner in said well bore and on said casing, said setting means further comprising a radially extending annular piston chamber, and a piston element in said chamber responsive to selectively disengage said carriage means, and means for selective entrapment of fluid within said apparatus; (2) running said apparatus in said well to a positionable depth within said well bore adjacent said casing; (3) applying pressure within said apparatus to activate said setting means to cause said carriage means to travel in said slot means to position for anchoring said liner within said well bore and on said casing and for shifting said longitudinally shiftable tubular body upwardly with respect to said sleeve means to cause said expander means carried by said tubular body to engage said gripping means carried on said sleeve means and move said gripping means outwardly into gripping engagement with said well bore casing; (4) rotating said tubular member extendible to the top of the well to release said tubular running tool from said longitudinally shiftable body for subsequent retrieval of said running tool out of said well bore; (5) discharge of said pressure contained in said apparatus through said means for selective entrapment of fluid within said apparatus; and (6) injecting within said tubular member extendible to the top of the well a cement slurry pumpable through said tubular member, said apparatus and said liner, for subsequent setting in said well bore between said well bore and said liner to affix said liner in said well bore.

4,096,914

ACIDIZING ASPHALTENIC OIL RESERVOIRS WITH ACIDS CONTAINING SALICYLIC ACID

William A. McLaughlin, Bellaire, and Edwin A. Richardson, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 6, 1976, Ser. No. 748,087
Int. Cl.² E21B 43/16
U.S. Cl. 166—307 **10 Claims**

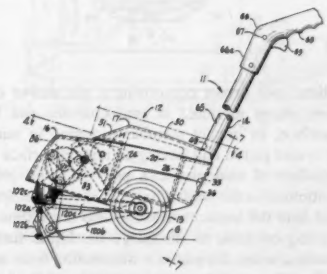
1. In a well treating process in which an aqueous hydrochloric acid-containing acid capable of dissolving solids in a manner increasing the permeability of a subterranean earth formation is brought into successive contacts with iron and an asphaltene-containing oil that is present within a subterreanean reservoir in a manner that may form permeability impairing iron-asphaltene solids, the improvement which comprises, including within at least the first portion of the aqueous hydrochloric acid-containing acid, a solution or homogeneous dispersion of at least enough salicylic acid to chelate with and prevent the formation of iron-asphaltene solids by substantially all of the ferric ions that become dissolved within the acid that enters the earth formation.

4,096,915

GROUND WORKING APPARATUS WITH TOOLS TO DRAW THE APPARATUS FORWARD

Hugh F. Groth, Brecksville, Ohio, assignor to True Temper Corporation, Cleveland, Ohio

Filed Apr. 11, 1977, Ser. No. 786,479
Int. Cl.² A01B 33/00, 39/06
U.S. Cl. 172—42 **12 Claims**



1. A ground working apparatus comprising:
support means having a forward portion and a rearward portion;
guide means connected to said support means for guiding and controlling the apparatus;
crankshaft means mounted on said support means for rotation about an axis generally parallel with the ground;

power transmission means for rotating said crankshaft means about the axis of rotation;

an axle disposed rearwardly of said crankshaft means and being generally parallel to the axis of rotation of said crankshaft means;

a pair of wheels rotatably mounted at opposite ends of said axle for transporting the apparatus over the ground;

at least three crankpins;

web means supporting said crankpins parallel with and angularly spaced about the axis of rotation of said crankshaft means and rotating said crankpins about said axis in response to rotation of said crankshaft;

at least three tool support arms each including a bearing end pivotally mounted on one of said crankpins and a tool supporting end extending toward the ground;

at least three elongated ground working tools, each connected to a tool supporting end of a respective tool support arm and disposed between said wheels at the forward portion of said support means, said tools having generally pointed ground impinging distal end portions; and

link means located between said wheels and pivotally secured to said tool support arms and to said axle for restricting said tool support arms to paths of movement wherein the ground working tools sequentially impinge upon the ground in a substantially vertical direction and proceed through the ground at a rearward inclination to draw the apparatus forward across the ground in response to rotation of said crankshaft means.

4,096,916

DIESEL PILE DRIVER

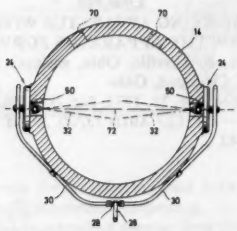
Rudolf Hennecke, Buoch, and Albert Haussmann, Oberboihingen, both of Germany, assignors to Delmag-Maschinenfabrik Reinhold Dornfeld, Esslingen am Neckar, Germany

Filed Feb. 27, 1975, Ser. No. 553,573

Claims priority, application Germany, Mar. 13, 1974, 2412036

Int. Cl.[2] E02D 7/12

U.S. Cl. 173—137 **4 Claims**



1. A diesel pile driver comprising a pile driver cylinder, a pile driver piston mounted in said cylinder and having an impact surface, an impact member mounted in said cylinder adjacent to said piston and having an impact surface facing the impact surface of said piston, a pair of liquid jet injection nozzles mounted in the wall defining said cylinder for injecting liquid fuel onto the impact surface of said impact member, said nozzles being operable to discharge the liquid fuel onto the impact surface when the piston is descending from an elevated position for subsequent impact atomization of the fuel induced by the piston engaging the impact member, said nozzles being positioned to discharge jets of liquid fuel that impinge upon one another on the impact surface of the impact member so as to destroy substantially the kinetic energy of flow of the liquid fuel, and a fuel injection pump for delivering fuel to said nozzles as an incident to the descending movement of the piston at said elevated position.

4,096,917

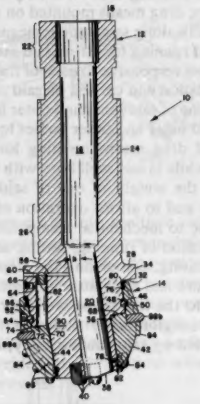
EARTH DRILLING KNOBBY BIT

Jesse W. Harris, 527 Sonnet Dr., San Antonio, Tex. 78216

Continuation of Ser. No. 617,959, Sep. 29, 1975, abandoned. This application Feb. 8, 1977, Ser. No. 766,589

Int. Cl.[2] E21B 9/08; E21C 13/01, 13/06

U.S. Cl. 175—228 **13 Claims**



1. A percussion drill bit having an upper end comprising an anvil surface, a lower end comprising a cutting bit, and a generally cylindrical side surface adapted to be received for slidable longitudinal movement in the casing of a fluid operated percussion hammer, said cutting bit having a central shank portion offset relative to the longitudinal axis of said drill bit and terminating in a cutting end surface, and a rotatable cutting head secured on said shank portion for rotary motion thereon.

4,096,918

METALLURGICAL VAT SUPPORT SYSTEM

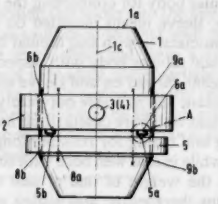
James Ingram Beggs, Hamilton, Canada; Karlheinz Langlitz, Mulheim, Germany; Gunter Schmitz, Duisburg, Germany, and Wolfgang Jansa, Moers, Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany

Filed Feb. 4, 1977, Ser. No. 765,795

Claims priority, application Germany, Feb. 5, 1976, 2604353

Int. Cl.[2] G01G 19/00

U.S. Cl. 177—145 **10 Claims**



1. Apparatus for mounting dynamic test cells for tilting metallurgical vats to avoid outside influences from affecting the test results, comprising

(a) a vat;

(b) extension means fixed to said vat and extending radially therefrom;

(c) an annular ring surrounding said vat;

(d) diametrically opposed bearings in said ring;

(e) said vat supported in said ring for tilting through angles of 360°; the improvement characterized by

(f) opposed horizontal surfaces on said extension means and said annular ring;

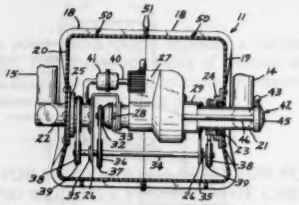
(g) a plurality of dynamic test cells mounted between said opposed horizontal surfaces; and
(h) a plurality of elongated vertically disposed expandable flexible connecting elements connecting said vat, said annular ring, and said extension means;
(i) whereby tilting said vat on said bearings also tilts said dynamic test cells.

4,096,919

PROPULSION UNIT FOR SKIERS

Richard G. Thompson, 312 County Rd. #5, Stillwater, Minn. 55082

Filed Sep. 2, 1976, Ser. No. 719,855
Int. Cl.[2] B62M *27/02*
U.S. Cl. 180—6 R **14 Claims**



1. Improved propulsion unit for skiers comprising:
(a) a hollow cleated roller of resiliently flexible material including two molded shell members each having an end wall and an open end, said end walls having axially aligned openings therein, at least one of said open ends containing flange means extending around its periphery, and said shell members being joined at their open ends;
(b) first and second inner hub members extending through the openings in said first and second end walls, respectively, for permitting relative rotation between said inner hub members and said roller;
(c) first and second handles attached to said first and second inner hub members, respectively;
(d) an engine frame positioned within said roller and rigidly mounted to said first and second inner hub members so as to secure said engine frame from rotation relative to both of said inner hub members;
(e) an engine mounted to said engine frame within said roller, said engine including an output shaft; and
(f) drive means operatively connecting said output shaft to each of said end walls for rotating said roller relative to said inner hub members.

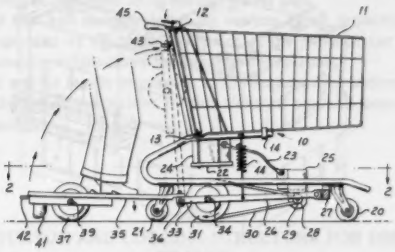
4,096,920

POWERED SHOPPING CART AND TRAILER

Bennington Heyn, 1009 Alexander Ave., Ridgefield, N.J. 07657

Filed Dec. 30, 1976, Ser. No. 755,789
Int. Cl.[2] B62D *59/04*
U.S. Cl. 180—11 **5 Claims**

1. A shopping cart-trailer vehicle for operation either by a riding passenger or walking operator, comprising:
(a) A shopping cart basket frame;
(b) A basket removably attached to said basket frame for causing a load to be transported;
(c) a pair of casterable wheels rotatably secured to the front of said basket frame;
(d) A pair of rear wheels rotatably secured to the rear of said basket frame;
(e) A tiltable trailer operatively associated with said basket frame for transportating a passenger wherein said tiltable trailer comprises a drive wheel carrier and a pivotable and tiltable passenger carrying platform operatively associated therewith and wherein said pivotable and tiltable passenger carrying platform further comprises a rubber friction brake mounted at the rear thereof for engaging the ground when said passenger shifts his weight rearward on said passenger carrying platform;
(f) A pair of drive wheels rotatably mounted on said trailer for alternately engaging or disengaging the ground when said tiltable passenger carrying platform is tilted forward or rearward by movement of said passenger forward or rearward on said tiltable passenger carrying platform;
(g) Drive means mounted on said trailer and operatively associated with said drive wheels for rotating said drive



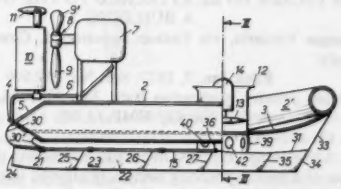
wheels when they engage the ground thereby propelling the cart-trailer vehicle along the ground;
(h) A pair of wheels rotatably mounted toward the rear of said trailer to allow the trailer to traverse the ground; and,
(i) A plurality of springs operatively associated at one end with said tiltable trailer and at their other end with said basket frame for urging said trailer and said drive wheels out of ground engagement when said passenger to be transported shifts his weight rearward on said passenger carrying platform.

4,096,921

VEHICLE SUPPORTED BY AN AIR CUSHION

Paul Francois Guienne, 5, rue de Bagatelle, Neuilly, France (92200)

Filed Jun. 10, 1977, Ser. No. 805,526
Int. Cl.[2] B60V *1/04, 1/16*
U.S. Cl. 180—121 **10 Claims**



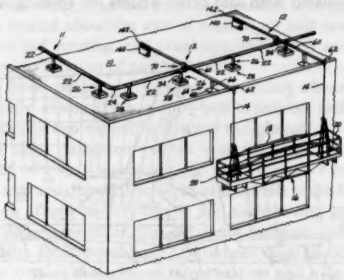
1. A vehicle supported by an air cushion extending beneath at least the greater part of the lower surface of the rigid structure of the vehicle, characterised in that, the said cushion is bounded on each side of the axis of the vehicle by two parallel skirts, a peripheral skirt and an inner skirt, inclined towards the inside of the vehicle defining between them a row of auxiliary air cushions separated by transverse partitions which form skirts at least in part inclined towards the rear with respect to the sense of movement of the vehicle, the bottoms of the auxiliary air cushions being formed by perforated plates articulated to one another, the edges of the said plates are connected to the rigid structure by flexible walls forming a flexible volume connected to the supply of air under pressure.

4,096,922

ROOF SUPPORT SYSTEM FOR A SUSPENDED STAGING

Harry S. Fisher, Renton, Wash., assignor to Spider Staging, Inc., Renton, Wash.

Filed Jun. 24, 1977, Ser. No. 809,553
Int. Cl.[2] E04G *3/10, 3/14*
U.S. Cl. 182—36 22 Claims



1. For use with a guidance and support rail positioned on a building roof above the roof level, inwardly from the roof edge, an outrigger which is co-operable with such rail for supporting a suspended staging from the roof, said outrigger comprising:

an elongated outrigger beam which during use extends outwardly from the side of the building;

carriage means including guideway means supporting said outrigger beam for endwise adjustment relative to the rail, and mounting means engageable with the rail, for mounting said guideway means onto the rail for both translational movement along the rail length and angular movement about the longitudinal axis of the rail;

said outrigger beam having an outboard end portion which during use projects outwardly of both the rail and the edge of the building roof, to serve as an overhead anchor for a suspension line of a suspended staging, and an inboard end portion which during use is positioned on the opposite side of the rail; and

leg means for supporting said outrigger beam, said leg means depending from said outrigger at a location inwardly of said beam outboard end portion and outwardly of the rail.

4,096,923

FIRE ESCAPE TO BE ATTACHED TO THE OUTSIDE OF A BUILDING

Giuseppe Verderio, via Padana Superiori 1, Gessate (Milan), Italy

Filed Jan. 7, 1977, Ser. No. 757,690
Claims priority, application Italy, Jan. 23, 1976, 19502 A/76
Int. Cl.[2] E04F *11/00*
U.S. Cl. 182—83 3 Claims

1. A fire escape attached in parallel position to the outside of a face of a building having vertically aligned safety outlets of like widths therein, said fire escaping comprising:

A. a different horizontal platform extending away from the building at the sill of each safety outlet,

i. the widths of the platforms being substantially equal to the widths of the associated outlets,

B. two supporting columns the lower ends of which are located adjacent and spaced outwardly from the base of the building,

i. said columns extending the whole height of the building,

ii. said columns being located adjacent the outside corners of the platform and supporting the same,

iii. one column being substantially horizontally registered with one vertically registered set of vertical edges of the safety outlets and the other column being substantially horizontally registered with the other vertically registered set of vertical edges of the safety outlets whereby the columns are mutually spaced apart in a horizontal direction parallel to said face of the building by substantially the width of the safety outlets,

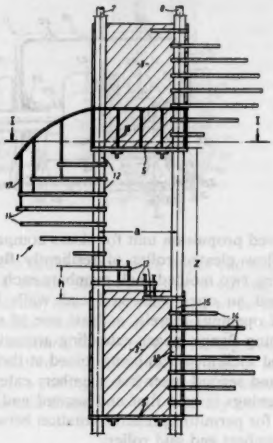
C. two sets of half-turn spiral stair winders

i. each set being associated with and supported by a different column, and

D. plural vertically registered series of straight steps,

i. each series of straight steps of the plural series being spaced away from the building and parallel to said face of the building and being located vertically midway between safety outlets,

E. the two sets of half-turn spiral stair winders, the plural series of straight steps and the platforms being interconnected in a sequence such that



i. a descending half-turn spiral stair winder of one set leads from a higher horizontal platform down and around to a series of descending straight steps which leads to a descending half-turn spiral stair winder of the other set which leads down and around to the next lower horizontal platform which leads to the next lower descending half-turn spiral stair winder of the one set in a repeating arrangement that terminates adjacent the base of the building,

F. whereby a building occupant in the event of fire when leaving the building by the fire escape exits through a safety outlet and then continuously moves down and around the fire escape with a minimum change in direction which occurs for only a short span at the platforms and the series of straight steps so that the building occupants can descend the fire escape rapidly and without hindrance.

4,096,924

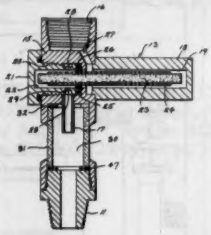
OILER ASSEMBLY

Frank J. Lyden, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowoc, Wis.

Division of Ser. No. 595,118, Jul. 11, 1975, Pat. No. 4,062,424.
This application Apr. 4, 1977, Ser. No. 784,422
Int. Cl.[2] F16N *17/06*
U.S. Cl. 184—58 9 Claims

1. In an oiler assembly for delivering a liquid lubricant to a point of lubrication, a vented reservoir containing the lubricant, a supply line extending from the bottom of the reservoir, a body having an inlet communicating with the supply line and an outlet, said body further having a bore with one end thereof communicating with the inlet and the other end thereof communicating with the outlet, a porous rod of sintered construction disposed in said bore between said inlet and said outlet and in spaced relation from the wall thereof, seal means disposed in

said bore between the porous rod and the wall of the bore to preclude passage of lubricant from the inlet end to the outlet end of the bore except by passage through said porous rod, tubing placing the outlet of the body in communication with



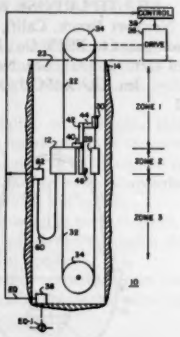
the lubrication point, and a source imposing a vacuum at the lubrication point, said porous rod being of selected density to provide for the desired feed rate of lubricant in response to the vacuum condition of the lubrication point.

4,096,925

ELEVATOR SYSTEM WITH DETECTOR FOR INDICATING RELATIVE POSITIONS OF CAR AND COUNTERWEIGHT

Robert W. Koob, Hopatcong, and Alan L. Husson, Budd Lake, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 8, 1977, Ser. No. 785,977
Int. Cl.² B66B *1/30, 1/50*
U.S. Cl. 187—29 R **7 Claims**



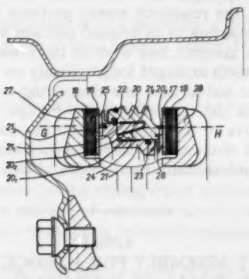
1. An elevator system, comprising:
a building having a plurality of floors and a hoistway,
an elevator car,
a counterweight,
said elevator car and counterweight being mounted for guided movement in adjacent vertical travel paths in the hoistway of said building to serve the floors therein,
detector means for determining the relative positions of said elevator car and counterweight,
said detector means including first and second vertically spaced sources of electromagnetic radiation, and first and second vertically spaced switching devices operable from a first condition to a second condition in response to electromagnetic radiation from said first and second sources of electromagnetic radiation, respectively,
shielding means,
said detector means and said shielding means being mounted for relative motion responsive to movement of said elevator car,
said shielding means shielding said first and second switching devices from the electromagnetic radiation of said first and second sources when the counterweight and elevator car bear a predetermined positional relationship to one another,
with said first and second switching devices being in their first conditions when shielded from the electromagnetic radiation,
first means responsive to at least one of the first and second switching devices being in a predetermined one of its conditions for providing a signal indicating the elevator car and counterweight are within a predetermined zone where collision could occur in the event the counterweight is outside of its normal travel path,
said first and second switching devices being sequentially operated by the shielding means as the elevator car and counterweight leave the predetermined zone,
and second means responsive to the sequence for indicating the relative positions of the elevator car and counterweight.

4,096,926

ACTUATOR AND COOLING STRUCTURE FOR DISK BRAKES

Hermann Klaue, Tour d'Ivoire 28e, 1820 Montreux, Switzerland

Continuation-in-part of Ser. No. 694,399, Jun. 9, 1976, which is a continuation-in-part of Ser. No. 634,896, Nov. 24, 1975, Pat. No. 4,054,189, which is a continuation of Ser. No. 415,681, Nov. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 288,287, Sep. 12, 1972, Pat. No. 3,885,650, which is a continuation-in-part of Ser. No. 73,566, Sep. 18, 1970, abandoned. This application Aug. 3, 1976, Ser. No. 711,276
Claims priority, application Germany, Dec. 2, 1969, 1960286; Dec. 27, 1969, 1965171; Dec. 27, 1969, 1965170; Switzerland, Nov. 17, 1972, 16741/72; Germany, Nov. 22, 1975, 2552451; Dec. 19, 1975, 2557331
Int. Cl.² F16D *55/10*
U.S. Cl. 188—71.4 **8 Claims**

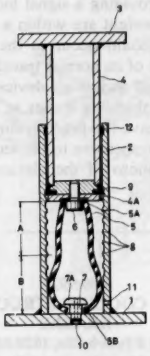


1. A fully lined disk brake adapted for motor vehicles comprising a rotating externally open, radially ribbed brake housing and a stationary brake carrier disposed over the brake housing, brake lining disks suspended on the brake carrier and fixed in the circumferential direction but freely movable axially,
said brake housing being formed of two annular parts and having an inner wall member having circumferentially spaced openings, said annular parts having yoke-shaped housing extension members integral with the inner wall member between openings, means for attaching the brake housing to a flange on a wheel hub comprising bolts which connect the yoke-shaped housing extension members between bolts which attach the wheel to the flange, and a hydraulic actuating device having two step rings, axial extending spaced projection members on each step ring, lying in the region of the step between the step rings, said projections contacting said brake disks.

4,096,927
SHOCK ABSORBER

Suehiro Takatsu, 3-21-6, Marunouchi, Naka-ku, Nagoya-shi, Aichi-ken, Japan

Filed Apr. 19, 1977, Ser. No. 788,766
Claims priority, application Japan, Jun. 11, 1976, 51-68363
Int. Cl.[2] F16F 9/30
U.S. Cl. 188—268 7 Claims



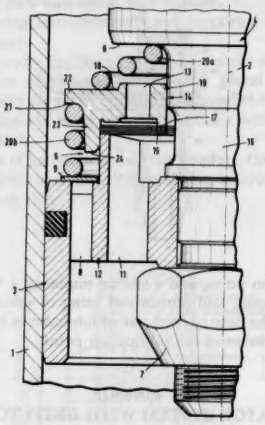
1. A shock absorber comprising a cylinder with a closed lower end, a hollow tubular cushion fabricated of elastic material within the cylinder, an inwardly bent edge formed on the cushion at the lower end thereof, a stopper on the cylinder extending into the lower end of the cushion and engaged by the inwardly bent edge thereof to prevent movement of the cushion beyond a specified limit, a plunger above the cushion slidably fitted within the cylinder, and resistance means between the cylinder and the plunger for inhibiting sudden reversion of the plunger to its original position while providing little resistance on the down stroke of the plunger whereby movement of the plunger into the cylinder causes the cushion to buckle and the resistance means prevents the plunger from suddenly reverting to its original position by the elasticity of the cushion material, and wherein the resistance means comprises saw-teeth arranged longitudinally on the inside wall of the cylinder and at least one elastic ring on the plunger that meshes with the saw-teeth as the plunger and the cylinder move relative to one another, each saw-tooth having an inwardly and downwardly sloping upper surface and a lower surface at substantially right angles to the inside wall of the cylinder.

4,096,928
VALVE ASSEMBLY FOR A SHOCK ABSORBER

Rolf Krafzig; Paul Langer, and Erhard Leppich, all of Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Jun. 14, 1977, Ser. No. 806,496
Claims priority, application Germany, Jun. 26, 1976, 2628893
Int. Cl.[2] F16F 9/348
U.S. Cl. 188—282 6 Claims

1. In a valve assembly for a shock absorber containing a damping medium and including means defining separate first and second channels for the opposite flow directions of the damping medium; the valve assembly having an axially displaceable valve body; at least one first valve and one second valve arranged to control the first channel and the second channel, respectively; the first valve including at least one resilient valve disc, and a first spring urging the valve body against the resilient valve disc for spring-biasing the resilient valve disc; the second valve including a closing disc and a second spring urging the closing disc into a closed position; and a shaft common to said first and second valves and being surrounded by the resilient valve disc and the closing disc; the improvement comprising an axially displaceable valve cage being common to said first and second valves, said valve cage having a cylindrical portion surrounding said resilient valve disc for a centered guiding thereof, said cylindrical portion

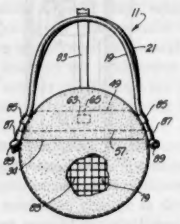


having, at an edge face, an abutment for cooperating with said closing disc; said valve cage further having a disc-like portion including first and second spring support faces for engagement with said first and second springs.

4,096,929
MULTIPURPOSE BAG

Nancy R. Frey, Newport Beach, Calif., and Shirley Schieber, Hanalei, Hi., assignors to ESEF Co., Newport Beach, Calif.

Filed Oct. 11, 1977, Ser. No. 840,551
Int. Cl.[2] A45C 3/00
U.S. Cl. 190—42 8 Claims



1. A multipurpose bag comprising:
first and second bag sections, each of said bag sections including outer and inner walls and means for interconnecting said walls to define a chamber, each of said bag sections having a peripheral edge;
said first bag section having means for providing access to the chamber thereof whereby items can be carried in said first bag section;
resilient means in said second bag section whereby said second bag section is adapted to serve as a cushion;
means for releasably joining said bag sections along a region adjacent the peripheries of said bag sections with the inner walls of the bag sections confronting each other whereby a compartment is defined between said bag sections;
means for providing an opening to said compartment through which access to said compartment can be obtained;
handle means coupled to at least one of said bag sections to facilitate manual grasping of the multipurpose bag, said

opening to said compartment facing generally upwardly when the multipurpose bag is carried by said handle means; and

said joining means being releasable to allow said bag sections to be separated whereby said first bag section can be used as a container while said second bag section is being used as a cushion.

4,096,930

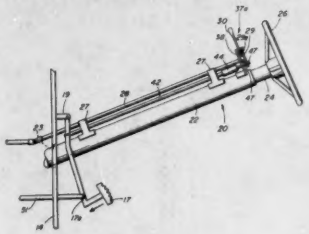
GEAR SHIFT SELECTOR BRAKE INTERLOCK

Frank Viscardi, 16 Benson Rd., Glen Rock, N.J. 07452

Filed Aug. 5, 1977, Ser. No. 822,294

Int. Cl.[2] B60K *29/02*; G05G *5/10*

U.S. Cl. 192—4 A **4 Claims**



1. A mechanically-actuated gear shift selector brake interlock mechanism, for motor vehicles having automatic transmissions comprising:

a gear shift selector plate mounted rotatably at the upper end of a conventional steering column sleeve;

said gear shift selector plate being circular and having gear position markings along the periphery of said selector plate;

interlock pin holes situated on said gear shift selector plate;

an interlock pin means consisting of a tubular elongated chamber containing an interlock pin spring and an interlock pin;

said interlock pin holes on said gear shift selector plate serving to receive interlock pin of the interlock pin means;

a brake interlock lever being an elongated rod-like structure extending from a linkage on the conventional brake pedal means to said interlock pin means;

said interlock pin captured in said interlock pin hole on said gear shift plate when conventional gear shift selector lever is at park or neutral positions;

said interlock pin being retracted from interlock pin hole located on said gear shift selector plate when brake pedal means has been actuated.

4,096,931

MODULAR STEERING CLUTCH AND BRAKE PACKAGE

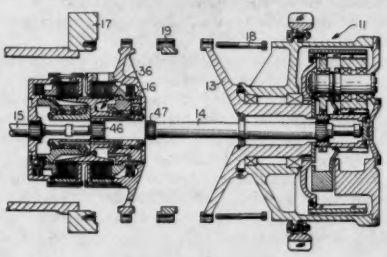
Gerald E. Whitehurst, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 16, 1976, Ser. No. 696,680

Int. Cl.[2] F16D *67/04*

U.S. Cl. 192—18 A **12 Claims**

1. A clutch and brake assembly for use in a power drive system having a mounting support, comprising: a first housing; a brake pack having a plurality of brake plates; first biasing means for providing a predetermined adjustable bias of said brake plates; first bolt means removably securing said brake pack in said first housing to define a brake assembly; a second housing; a clutch pack having a plurality of clutch plates; second biasing means for providing a predetermined bias of said clutch plates; second bolt means removably securing said clutch pack in said second housing to define a clutch assembly; a carrier defining a mandrel for maintaining the alignment of said brake plates and said clutch plates during adjustment of the bias thereof by said first and second biasing means; and third bolt means for mounting the clutch and brake assemblies as a unit to said mounting support whereby said clutch and brake assemblies may be removed as separate assembled units



from the support for servicing of either when desired without disassembly of the other.

4,096,932

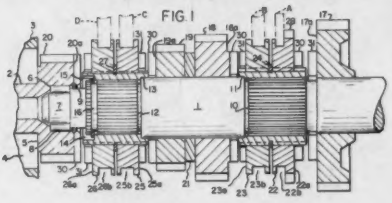
DRIVE FOR POWER TRANSMISSION

Joseph C. Liberty, Jr., 4216 Grindley Park, Dearborn Heights, Mich. 48125

Filed Feb. 7, 1974, Ser. No. 440,454

Int. Cl.[2] F16D *21/04*

U.S. Cl. 192—48.91 **3 Claims**



1. A power transmission device including, a drive shaft,

at least one rotatable driving element carried by said drive shaft,

a driven shaft,

at least one rotatable driven member carried by said driven shaft,

drive means carried by said driving element,

driven means carried by said driven member,

said driven member having sliding travel between a neutral position and a position of releasable driving engagement wherein said drive means is releasably engaged with said driven means,

an actuator to effect said sliding travel of said driven member,

said driving engagement being effective to impart a rotational drive to said driven member, when the rotational speed of said driving element exceeds the rotational speed of said driven member, wherein the improvement comprises,

a first adapting means adapting said drive means for reverse engagement with said driven means in the sliding travel of said driven member when the rotational speed of said driven member exceeds the rotational speed of said driving element, to retard the rotational speed of said gear,

a second adapting means adapting said driven means to receive such reverse engagement,

a first lateral face on said element,

a second lateral face on said member, confronting said first lateral face,

said drive means being carried by said first lateral face, and said drive receiving means being carried by said second lateral face,

said drive means including a driving surface disposed approximately transversely to said first lateral face,

said driven means including a drive receiving surface disposed for engagement by said driving surface,

a first cam surface inclined relative to and convergent with said drive surface,

a second cam surface inclined relative to and convergent with said drive receiving surface,

said cam surfaces co-acting to impel said driven member from said rotatable driving element to a neutral position when the rotational speed of said member exceeds the rotational speed of said element, and;

said first and second adapting means being lips formed respectively on said first cam surface and said second cam surface, for selective engagement of said lips responsive to said actuating means.

4,096,933

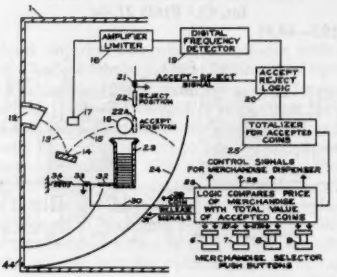
COIN-OPERATED VENDING SYSTEMS

Frank Massa, Cohasset, Mass., assignor to Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees of The Stoneleigh Trust u/d/t, both of Cohasset, Mass.

Filed Nov. 16, 1976, Ser. No. 742,192

Int. Cl.[2] G07F *3/02*

U.S. Cl. 194—100 A **12 Claims**



1. In combination in a coin-operated vending system, a plurality of storage sections containing a plurality of dispensable items, a plurality of openings for receiving a plurality of coins of different denominations, guide means associated with said openings for directing the trajectory of a coin after a coin is deposited in one of said openings, means located along the trajectory of said coin for causing said coin to vibrate at its resonant frequency mode, said means including a rigid plate positioned with one surface of said plate perpendicular to the plane of the trajectory so that the edge of the coin strikes said surface while the coin is falling during the initial stage of its trajectory and while the plane of the coin is at right angles to said rigid surface at the moment of contact, sensor means responsive to said resonant frequency mode of said vibrating coin, frequency measurement means associated with said sensor means, frequency classification means associated with said frequency measurement means, said frequency classification means characterized in that each different coin is separately classified in accordance with its different resonant frequency mode of vibration, means for returning said deposited coin if said frequency classification means indicates that the measured resonant frequency of said coin lies outside the established normal frequency range of vibration for an acceptable valid coin, coin identification means characterized in that the denomination of said deposited coin is identified from the measured resonant frequency of said coin if the resonant frequency lies within the acceptable frequency range established for an acceptable valid coin, coin storage means for holding acceptable valid coins which have been so recognized by said coin identification means, totalizing means characterized in that a signal is generated by said totalizing means which is representative of the total value of the accepted coins, merchandise dispensing means associated with said plurality of storage sections, control means for selectively operating said plurality of storage sections for the dispensing of a desired item, said selectively operable control means characterized in that it is activated only when the totalizer signal, which is representative of the total value of the accepted coins, indicates that the total value of the accepted coins equals or exceeds the price of the selected item of merchandise to be dispensed.

4,096,934

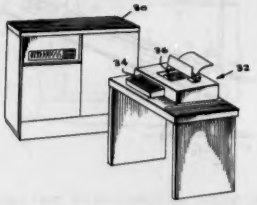
METHOD AND APPARATUS FOR REPRODUCING DESIRED IDEOGRAPHS

Philip George Kirmser, 1009 Michael Rd., and Kuo-Kuang Hu, 925 Mission Ave., both of Manhattan, Kans. 66502

Filed Oct. 15, 1975, Ser. No. 622,773

Int. Cl.[2] B41J *1/52*

U.S. Cl. 400—110 **30 Claims**



1. An input-output typing machine for selecting and printing desired ideographs from a list of available ideographs comprising means for storing information representing at least a portion of the phonetic spelling of the commonly used names of the ideographs and for storing information representing a descriptive characteristic of each ideograph in the list of available ideographs to uniquely identify each available ideograph, means for inputing information representing at least a portion of the phonetic spelling of a desired ideograph, means for inputing information representing the descriptive characteristic of the desired ideograph, means for comparing the information representing the phonetic spelling and descriptive characteristic of the desired ideograph with the stored information of the available ideographs, means for selecting the desired ideograph based on the stored information and the input information and means for visually reproducing the selected ideograph thereby permitting the use of a conventional keyboard by a person without special training to uniquely identify and print each desired ideograph.

4,096,935

INPUT DEVICE

Takayoshi Hanakata, Yokohama, and Shunji Mitaka, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 551,394, Feb. 20, 1975, abandoned. This application Aug. 12, 1976, Ser. No. 713,884

Claims priority, application Japan, Feb. 22, 1974, 49-21682; Feb. 22, 1974, 49-21683; Feb. 7, 1975, 50-16101

Int. Cl.[2] B41J *5/12*

U.S. Cl. 400—479 **11 Claims**

1. In apparatus of the type wherein desired letters, symbols or the like may be printed in a given direction on a recording medium by a printing device, in response to the depression of corresponding keys on a keyboard, and having means for effecting relative displacement between said printing device and said recording medium wherein said printing device and said recording medium are relatively displaced in said given direction after the printing of each of said letters, symbols or the like, and means for printing a corrective character on said recording medium,

an input device comprising:

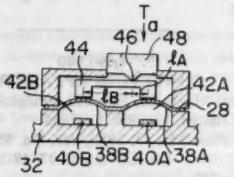
(a) first switching means for generating a first instruction for

effecting relative displacement between said printing device and said recording medium in the direction opposite to said given direction;

(b) second switching means for generating a second instruction for actuating said corrective character means;

(c) a first push button;

(d) a second push button;



(e) means responsive to the displacements of said first and second push buttons for discriminatively actuating said first and second switching means so that said first switching means and said second switching means are driven in the aforementioned order by the displacement of said first push button and that said second switching means and said first switching means are driven in the aforementioned order by the displacement of said second push button.

4,096,936

SELECTIVELY CONTROLLABLE UNLOADING ARRANGEMENT FOR SORTING CONVEYOR CONSTRUCTIONS

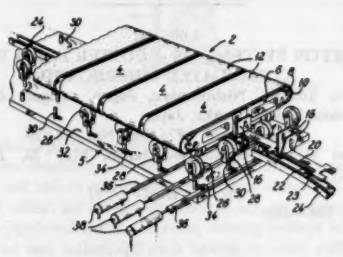
Jacob August Nielsen, Vibly J., Denmark, assignor to Kosan Crisplant A/S, Denmark

Continuation of Ser. No. 270,030, Jul. 10, 1972, abandoned, which is a continuation of Ser. No. 86,250, Nov. 3, 1970, abandoned. This application Aug. 19, 1975, Ser. No. 605,814

Claims priority, application United Kingdom, Nov. 3, 1969, 53783/69; Nov. 19, 1969, 56596/69

Int. Cl.[2] B65G *43/00*

U.S. Cl. 198—356 **18 Claims**



1. A sorting conveyor having a main conveyor operable to move forwardly in an article carrier run past at least two stationary discharge stations, said main conveyor comprising a plurality of juxtaposed links each constituted by a conveyor element h ing a cross-conveyor means mounted cross-wise of the moving direction of said conveyor element, movement control means operable to cause said cross-conveyor means to carry out a conveying movement being located adjacent said discharge stations and being selectively operable for effecting diversion of an article resting on said cross-conveyor means at a selected one of said discharge stations, said conveyor means of each pair of consective conveyor elements being operable to effectively support an article of a length greater than the width of the cross-conveyor means of each of said conveyor elements, length registering means being provided for resigtering the length of each article conveyed on said main conveyor belt, said movement control means being operatively connected with said length registering means so as to cause conveying movement of said cross-conveyor means of as many consecutive conveyor elements as occupied by an article to be diverted.

4,096,937

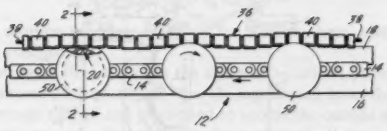
ARTICLE TRANSPORT SYSTEM

Sydney Johnstone Wallace, Point Roberts, Wash., assignor to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 622,092, Oct. 14, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,451

Int. Cl.[2] B65G *17/32, 29/00, 47/24, 47/84*

U.S. Cl. 198—377 **3 Claims**



1. An article transport system comprising: a conveyor for moving a plurality of hollow cylindrical articles along a travel path for subjection of said articles to irradiation, said conveyor including a plurality of holders for said articles rotatably mounted at spaced locations on said conveyor, each of said holders having a pulley portion associated therewith and disposed to rotate about a generally horizontal axis; and a rail assembly comprised of a series of axially-aligned, generally cylindrical members, the axial dimension of each said member being less than the recited spacing between said holders, and means supporting said members in mutually abutting relationship while permitting independent movements of adjacent ones thereof relative to said supporting means in a substantially vertical direction, said rail assembly being mounted to extend along at least a portion of said travel path of said conveyor, and with said cylindrical members disposed above the recited horizontal axis and effective to undergo the recited independent movements while resting upon and riding within said pulley portions as said holders are moved therepast by said conveyor, said cylindrical members frictionally engaging said pulley portions to effect uniform rotation of said holders as they are moved by said conveyor along said travel path for irradiation of said articles.

4,096,938

APPARATUS FOR TRANSFERRING CIGARETTES ON A CIGARETTE PACKAGING MACHINE

Leslie Elmer Payne, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation of Ser. No. 498,823, Aug. 19, 1974, abandoned. This application Jan. 8, 1976, Ser. No. 648,605

Int. Cl.[2] B65G *65/44*

U.S. Cl. 198—420 **9 Claims**

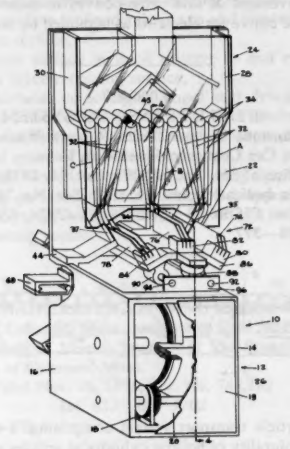
1. An improved supply and transfer apparatus for a cigarette packing machine which transfers groups of twenty cigarettes into compression pockets carried on an intermittent motion conveyor of said cigarette packing machine, said compression pockets being indexed adjacent said supply and transfer mechanism, said apparatus comprising:

(a) at least three transfer chambers, each receiving a group of cigarettes, each of said transfer chambers being in registration with one of three adjacent compression pockets on said conveyor when said conveyor is indexed;

(b) hopper means connected to said transfer chamber for receiving a supply of cigarettes and distributing said cigarettes to said transfer chambers;

(c) at least three plungers being operated simultaneously to engage the groups of cigarettes in said transfer chambers and insert the cigarettes into the three adjacent compres-

sion pockets in registration with said transfer chambers when said conveyor is indexed; and



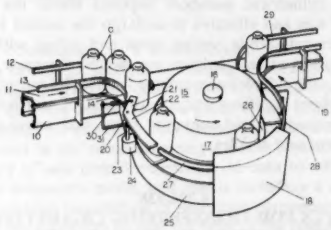
(d) means for operating said plungers only after at least each third successive index of said conveyor.

4,096,939

APPARATUS FOR FEEDING GLASS CONTAINERS AT SPACED INTERVALS

Darius O. Riggs, Ottawa Lake, Mich., and Charles G. Vogel, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 12, 1976, Ser. No. 666,294
Int. Cl.[2] B65G *43/00, 47/26*
U.S. Cl. 198—460 **6 Claims**



1. In apparatus for feeding glass containers to a test device wherein:

a moving, horizontal conveyor carries a plurality of containers in single file to a means for guiding containers from the side of the conveyor into the entrance of a testing device mounted at the side of the conveyor, the test device having container sidewall engaging means for moving the containers in precession from the entrance, to and through a testing station, the improvement comprising:

a generally arcuate, horizontal arm, said arm having a short leg and a long leg;

means mounting said arm at the entrance to said test device for pivotal movement about a vertical axis intermediate said legs;

said short leg, in a first position, contacting a container and blocking movement thereof into engagement with said container sidewall engaging means;

said long leg of said arm engaging containers that are being moved by said container engaging means to a point just prior to the testing station;

means biasing the long leg of said arm into engagement with a container;

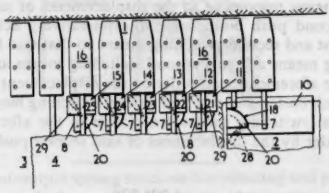
said biasing means permitting said arm to pivot into a second position when the long leg is not in engagement with a container to thereby move the short leg out of said first position and permitting a single container to move into engagement with said engaging means and said long leg of said arm whereby containers will be fed to the testing device at spaced intervals depending on the length of said long leg.

4,096,940

CONVEYING APPARATUS

David Garner, Measham, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Mar. 3, 1975, Ser. No. 554,525
Int. Cl.[2] B65G *47/18*
U.S. Cl. 198—560 **5 Claims**



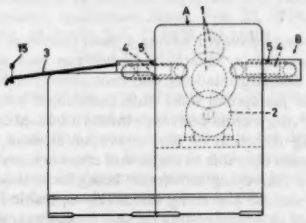
1. Apparatus for packing broken rock debris adjacent to a roadway in an underground mine, comprising a deck assembly mountable in the roadway and having an elevated deck, a hopper located below the deck for receiving broken rock debris falling from the deck, a first displaceable paddle device movably mounted so as to urge broken rock debris out of the hopper in a generally horizontal direction, a second displaceable paddle device movably mountable on advanceable staker means, displacing means for displacing said first and second paddle devices which are repeatedly traversable to and fro in a conveying mode and in a non-conveying mode, and control means for the displacing means which thereby, in use, traverse the paddle devices in the conveying mode in sequence.

4,096,941

CONVEYOR SYSTEM FOR A CUTTER FOR A WEB OF CORRUGATED FIBERBOARD

Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 29, 1976, Ser. No. 745,926
Claims priority, application Japan, May 28, 1976, 51-69078[U]
Int. Cl.[2] B65G *47/91*
U.S. Cl. 198—689 **3 Claims**



1. A conveyor system for feeding a web of corrugated fiberboard into and out of a cutter, said conveyor system comprising:

belt conveying means at the entrance into and exit from said

cutter for carrying said fiberboard into and from said cutter, said conveying means comprised of:

a plurality of parallel, longitudinal perforated conveyor belts arranged side by side leading into and from said cutter;

suction box means beneath said plurality of perforated conveyor belts and having a plurality of openings in the top thereof aligned with said perforations in said conveyor belts for attracting said conveyor belts and said fiberboard thereon;

vacuum source means connected to said suction box means for creating a vacuum in said suction box means;

suction control means within said suction box means for controlling the suction through said openings in said suction box means beneath said conveyor belts; and

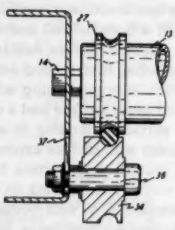
detecting means at the forward end of said belt conveying means and connected to said suction control means for detecting the width of the fiberboard on said conveyor belts and for regulating said suction control means in said suction box means corresponding to the width of fiberboard being carried by said conveyor belts, whereby the effective width of said belt conveying means is adjusted by providing vacuum from said suction box means only beneath those conveyor belts carrying fiberboard, said detecting means being comprised of a light source and a phototube on opposite sides of each of said parallel, longitudinal perforated conveyor belts.

4,096,942

ROLLER TYPE OF CONVEYOR

Thomas Paul Shepherd, S45W22061 Tansdale Rd., Waukesha, Wis. 53186

Filed Oct. 1, 1976, Ser. No. 728,559
Int. Cl.[2] B65G *13/07*
U.S. Cl. 198—781 **15 Claims**



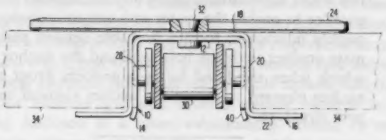
1. A roller type of conveyor comprising a support, a plurality of rollers rotatably mounted on said support for supporting items on said rollers and moving the items along said rollers when said rollers are rotated and each of said rollers having an external cylindrical surface thereon, driving pulleys rotatably mounted on said rollers and each having an inner cylindrical surface slightly larger than said external cylindrical surface and in contact therewith to be rotatable relative to said rollers to slip thereon and also to be in selectable frictional drive contact relative to said rollers for frictionally drivingly rotating said rollers when said pulleys are pressed against said rollers, each of said pulleys having an external cylindrical groove, a powered driver, an endless drive means drivenly connected with said powered driver and extending between and trained in said grooves of said pulleys and being taut between said pulleys for engaging said grooves and positioning said pulleys relative to the longitudinal axes of said rollers, and a tension member in contact with said drive means on the side thereof opposite from the side said drive means is in contact with said pulleys for urging said drive means toward said pulleys and thereby press said pulleys against said rollers to effect the frictional drive between said pulleys and said rollers.

4,096,943

SNAP-ON TOP PLATE ASSEMBLY

C. Stewart Gentsch, Longmeadow, Mass., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Nov. 28, 1975, Ser. No. 635,837
Int. Cl.[2] B65G *17/14*
U.S. Cl. 198—793 **13 Claims**



7. A snap-on top plate assembly for a roller chain, said assembly comprising:

(a) an inside steel saddle in the shape of a channel having a base and two upstanding legs, the legs having holes therethrough shaped and positioned to accept the outside ends of the pins in a link of roller chain when the link is positioned within said inside saddle, said inside saddle being made from a relatively but not totally inflexible material;

(b) an outside steel saddle in the shape of a channel having a base, two upstanding legs, and flanges extending outwardly from the ends of the legs remote from the base, said outside saddle being dimensioned to accept said inside saddle therewithin with the base and the legs of said outside saddle in close engagement with the base and the legs of said inside saddle and the legs of said outside saddle extending up along the legs of said inside saddle at least past the holes therein, said outside saddle being made from a relatively but not totally inflexible material;

(c) a top plate;

(d) first means for retaining said inside saddle in place within said outside saddle; and

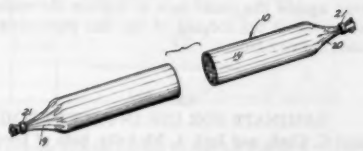
(e) second means for retaining said top plate in place on the base of said outside saddle on the side thereof opposite to said inside saddle.

4,096,944

CARTRIDGE FOR GROUTING AN ANCHOR ELEMENT IN A HOLE OF A SUPPORT STRUCTURE

Robert E. Simpson, Spokane, Wash., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 809,883, Jun. 24, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,700
Int. Cl.[2] B65D *25/08;* C04B *11/14;* E21D *11/00*
U.S. Cl. 206—219 **6 Claims**



1. A cartridge for grouting an anchor element in an elongated hole of a support structure, comprising:

an elongated tubular casing fabricated of a frangible material capable of being punctured and shredded by an anchor element thrust into the cartridge and having a diameter between enclosed ends sufficient to enable the cartridge to be introduced into the hole;

a heterogeneous mixture of a continuous phase of dry hydraulic cement powder and a discontinuous phase of a multitude of water-containing microcapsules essentially

uniformly dispersed in the continuous phase that fills the interior of the tubular casing between the enclosed ends; wherein the microcapsules have diameters in a range of 400 to 5000 microns and have inert, frangible shells enclosing droplets of liquid water that are pressure sensitive and are capable of being progressively ruptured by the force of said anchor element being thrust into the cartridge when the cartridge is positioned in the hole to thereby dispense the water substantially uniformly throughout the cement powder to enable the water and cement powder to thoroughly interact to form a flowable cement paste in intimate contact with the hole wall and the anchor element, which when solidified forms a uniform grout about the anchor element to secure the anchor element to the support structure.

4,096,945

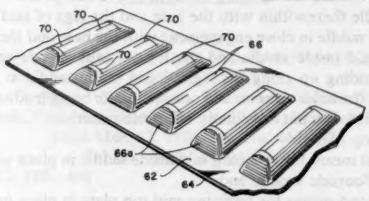
SYSTEM FOR INJECTING PARTICULATE MATERIAL INTO THE COMBUSTION CHAMBER OF A REPETITIVE COMBUSTION COATING APPARATUS

Rosser B. Melton, Jr., Helotes, and Elbert M. Hubbard, Dallas, both of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Division of Ser. No. 458,884, Apr. 8, 1974, Pat. No. 3,893,578. This application Nov. 4, 1974, Ser. No. 520,672

Int. Cl.[2] B65D *75/62*

U.S. Cl. 206—469 **20 Claims**



1. The encapsulating tape for successively delivering predetermined quantities of particulate coating material to a pneumatic stripping station where the particulate coating material is pneumatically removed from the tape and injected into a heating and pressurizing chamber, said tape comprising a plurality of discrete encapsulating pockets each filled with a predetermined quantity of very finely ground particulate material the particles of which are capable of being heated and impacted against a work piece to form a specialized coating on the work piece, each pocket having a pneumatic inlet face and a pneumatic outlet face, the pneumatic inlet face including means for admitting gas to the interior of the pocket to burst the outlet face before the inlet face is deformed by gas pressure applied to the inlet face to an extent sufficient to press the particulate material against the outlet face to rupture the outlet face to thereby prevent the lodging of the fine particulate material between the two faces.

4,096,946

LAMINATE FOR USE IN PACKING OIL

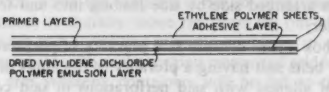
Herbert G. Cook, and Jack A. McAvity, both of Toronto, Canada, assignors to E.S. & A. Robinson (Canada) Ltd., Toronto, Canada

Continuation of Ser. No. 506,582, Sep. 16, 1974, abandoned, which is a continuation of Ser. No. 277,049, Aug. 1, 1972, abandoned. This application Mar. 15, 1976, Ser. No. 667,030

Int. Cl.[2] B65D *75/26*

U.S. Cl. 206—484.2 **8 Claims**

1. A package formed from a sheet material which is a laminate consisting essentially of outer layers of copolymer of ethylene with propylene or butene and at least one inner barrier layer consisting of a vinylidene chloride polymer in the form of a dried emulsion coating which is free of plasticizer, said barrier layer being bonded to the inner surface of said outer layers, one of said ethylene polymer layers being bonded



to said dried vinylidene chloride polymer coating layer by means of an oil resistant adhesive and an oleaginous material contained within said package.

4,096,947

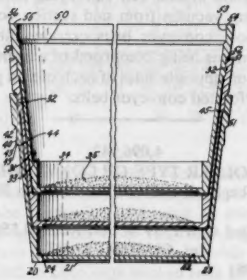
SYNTHETIC RESINOUS NESTING CUP CONSTRUCTION

Milton Morse, 44 Honeck St., Englewood, N.J. 07631

Filed Jan. 21, 1977, Ser. No. 761,056

Int. Cl.[2] B65D *1/22, 21/00*

U.S. Cl. 206—519 **3 Claims**



1. A nesting cup construction of resilient synthetic resinous material comprising: a bottom wall and a generally conically shaped side wall connected thereto, said side wall having a free upper edge, and including first, second and third wall portions; said first wall portion interconnecting with said bottom wall, and having a conical outer surface and a conical inner surface, said conical outer surface extending to said second wall portion, said conical inner wall surface extending past said second wall portion; said second wall portion being disposed above said conical outer surface, and having an outer surface extending upwardly from said first wall portion to include a first tapering portion forming a first ledge, and a first cylindrical surface extending upwardly from said ledge; said third wall portion being disposed above said second wall portion and having an inner second cylindrical surface adjacent a free upper edge thereof of unstressed diameter slightly less than that of said first cylindrical surface of said second wall portion, and a tapering surface forming a second ledge selectively engageable with said first ledge; whereby upon the nesting of a first cup within a second cup, the ingress of the former with respect to the latter is limited by engagement of said first and second ledges, and a sealing action is accomplished by the sliding engagement of said first and second cylindrical surfaces resulting in the resilient expansion of said second cup.

4,096,948

COOK-IN CARTON WITH INTEGRAL REMOVABLE SECTION AND BLANK THEREFOR

Morris W. Kuchenbecker, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

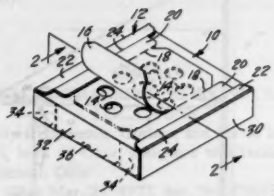
Filed Mar. 18, 1977, Ser. No. 779,807

Int. Cl.[2] B65D *5/70*

U.S. Cl. 206—622 **8 Claims**

1. A carton adapted for use in heating a product contained therewithin, comprising a plurality of hingedly interconnected

panels, two of said panels being similarly dimensioned and configured and being secured in face-to-face contact to provide a two-ply wall in said carton, a portion of the inner of said two panels having openings formed therein to permit substantial exposure of the contained product, the outer of said two panels having a weakened area extending to opposite margins thereof defining therein a removable section dimensioned and configured to cover said open portion of said inner panel, said removable section overlying said inner panel to close said openings thereof, a rectilinear fold line extending between said



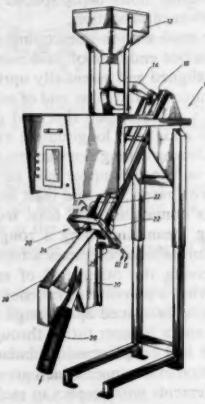
opposite margins of said outer panel at a location spaced to each side of said weakened area to define foldable tab portions therebetween, the portions of said outer panel lying outwardly of said tab portions being secured to said inner panel so that, upon removal of said removable section of said outer panel, said tab portions may be folded about said fold lines away from said inner panel, to thereby provide support legs on said carton, and disengagement of said removable section from the remainder of said outer panel uncovering said openings and effecting substantial exposure of the product contained within said carton.

4,096,949

APPARATUS FOR PERFORMING A THREE-WAY SORT

Michael C. Hoover, and William C. Long, both of Houston, Tex., assignors to Geosource Inc., Houston, Tex.

Filed Jun. 1, 1976, Ser. No. 691,908
Int. Cl.[2] B07C 5/342
U.S. Cl. 209—74 M **16 Claims**



1. Apparatus for sorting particles into three groups according to predetermined physical characteristics comprising:

means for providing a singulated stream of particles;

first classifying means including a first viewing zone for classifying each particle passed therethrough according to a first physical characteristic thereof and for generating a first electrical trip signal responsive to a particle having said first physical characteristic;

second classifying means including a second viewing zone for classifying each particle passed therethrough according to a second physical characteristic thereof and for generating a second electrical trip signal responsive to a particle having said second physical characteristic;

a first ejector element associated with said first classifying means and spaced a first predetermined distance therefrom, said first ejector element responsive to said first trip signal to expel a particle having said first physical characteristic from said particle stream;

a second ejector element associated with said second classifying means and spaced a second predetermined distance therefrom, said second ejector element responsive to said second trip signal to expel a particle having said second physical characteristic from said particle stream, said first ejector element and said second ejector element both being disposed in a plane substantially normal to said particle stream and 180° from one another across said particle stream;

first signal delay means disposed intermediate said first classifying means and said first ejector element for delaying a trip signal generated by said first classifying means for a first predetermined period of time functionally related to the time required for a particle to traverse said first predetermined distance;

second signal delay means disposed intermediate said second classifying means and said second ejector element for delaying a trip signal generated by said second classifying means for a second predetermined period of time functionally related to the time required for a particle to traverse said second predetermined distance; and,

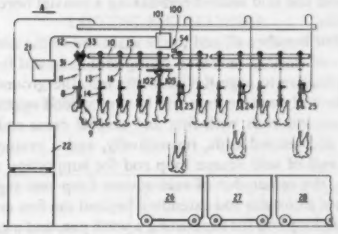
means responsive to the simultaneous output of trip signals from said first and second signal delay means to said first and second ejector elements for permitting actuation of one of said ejector elements and for inhibiting actuation of said other ejector element.

4,096,950

SORTING SYSTEMS AND SENSING DEVICES FOR USE THEREWITH

Richard Morley Brook, Huddersfield, England, assignor to AutoSystems Limited, England

Continuation-in-part of Ser. No. 495,016, Aug. 5, 1974, Pat. No. 3,997,013. This application Oct. 27, 1976, Ser. No. 736,059
The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.
Int. Cl.[2] B07C 5/28
U.S. Cl. 209—121 **15 Claims**



1. A conveyor system for use in sorting a plurality of articles according to their weight, said system comprising:

(a) an overhead conveyor comprising a continuous rail defining a path and a plurality of shackles movable therealong in succession, each shackle being arranged to carry a poultry carcass,

(b) a weighing station disposed along said path,

(c) an electronic weight sensing transducer arranged at said weighing station to emit a weight signal related to the weight of each poultry carcass as said carcass passes through said weighing station,

(d) a plurality of sorting stations spaced apart along said path

downstream of said weighing station, each sorting station being associated with carcasses having a particular weight range,

(e) a shackle release device and a carcass receiving container arranged at each sorting station,

(f) a sensing device arranged to emit a counting pulse each time a shackle passes said sensing device, and

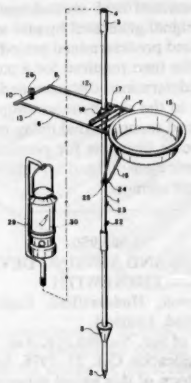
(g) control means connected to said weight sensing transducer, said sensing device and each of said shackle release devices to receive and store said weight signals and said counting pulses and to actuate each shackle release device when there arrrives at the associated sorting station a shackle carrying a carcass having a weight lying in the weight range associated with the particular sorting station to sort said articles by weight.

4,096,951

CAMPING UTILITY STAND

Leroy K. Menssen, Estherville, Iowa, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 12, 1977, Ser. No. 796,228
Int. Cl.[2] A47K *1/04, 1/05*
U.S. Cl. 211—207 **3 Claims**



1. A camping utility stand, comprising

a main rod having spaced opposite first and second ends, said first end having a point thereon for piercing supporting ground and said second end having a coaxial bore formed therein;

an anchor member affixed to the main rod in the area of the first end thereof and surrounding said main rod for applying pressure to urge the main rod into the ground;

a substantially square loop rod having spaced opposite first and second ends with first and second cross rods at the first and second ends, respectively, and a grating at the first end of said square loop rod for supporting a bar of soap, the remainder of said square loop rod supporting towels, a circular rod extending beyond the first end of the square loop rod for supporting a wash pan, and a generally V-shaped support rod pivotally mounted on the first cross rod;

mounting means pivotally mounting the square loop rod on the main rod in an adjustable manner whereby said square loop rod is positionable at a desired point along the length of the main rod from a position substantially perpendicular to said main rod to a position substantially next-adjacent said main rod; and

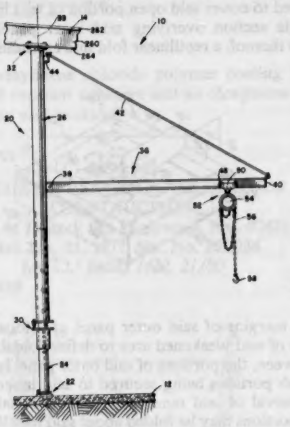
a plurality of spaced protruding members on the main rod for supporting the end of the support rod farthest from the square loop rod to maintain said square loop rod substantially perpendicular to said main rod at different points therealong.

4,096,952

ADJUSTABLE JIB CRANE

Richard E. Diggs, 12A Rd., Carthage, Mo. 64836

Filed Dec. 21, 1976, Ser. No. 752,869
Int. Cl.[2] B66C *23/06*
U.S. Cl. 212—56 **20 Claims**



1. A jib crane comprising:

a base element mounted on a floor, said base element including an anchor embedded in the building floor, a floor plate mounted on the building floor and fixed to said anchor, an annular collar having a top rim and a bottom rim fixed to said floor plate to be coaxial with said anchor, a rotation boss seated in the annulus defined in said annular collar;

a lower tubular mast section having a mounting flange fixed to one end thereof, and a bearing surface on said lower mast section one end receiving said rotation boss, said mounting flange having a lower surface resting on said base element annular collar top rim, said lower mast section having a plurality of fastener receiving holes defined therein, said fastener holes being spaced apart longitudinally of said lower mast section;

an upper tubular mast section telescopingly receiving said lower section in one end thereof; said mast sections being longitudinally aligned and essentially upright;

a top element connecting the other end of said upper section to a ceiling in a manner such that said upper section is freely rotatable about the longitudinal axis thereof, said top element including ceiling slope accommodating means for connecting said upright upper mast section to a ceiling which slopes with respect to said mast sections;

connecting means connecting said mast sections together, said connecting means including a rough crane height adjustment means which comprises a tubular jacket telescopingly receiving the other end of said lower mast section and having a plurality of fastener receiving holes defined therein to be spaced apart longitudinally on said tubular jacket, and a fastener fitting through said fastener receiving holes and coupling said tubular jacekt to said lower mast section in a manner which prevents rotation of said coupled elements with respect to each other thereby further preventing rotation of said upright upper mast section with respect to said top element, and a fine crane height adjustment means which comprises a first flange on said tubular jacket, a second flange mounted on said upper mast section one end and having a plurality of bolt receiving openings defined therein, said flanges being facially opposed, a plurality of bolts mounted on said first flange and received in said second flange bolt receiving openings, said bolts preventing rotation of said upper mast element with respect to said tubular element so that said mast sections are coupled together in a non-rotatable

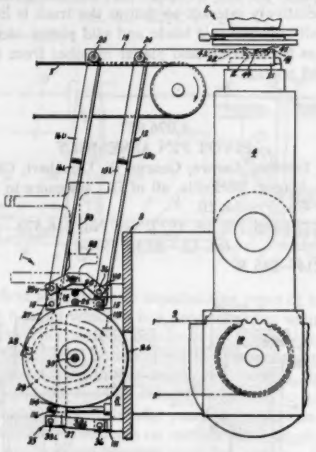
manner by said connecting means, and a locking nut threaded onto each bolt and engaging said second flange, said flanges being separated by a distance determined according to the position of said locking nuts on said bolts so that the height of the crane is adjustable via said fine adjustment means independent of a crane height adjustment via said rough adjustment means and with said mast sections being non-rotatably connected together by said connecting means and load handling means connected to one of said most sections to move a load horizontally and vertically.

4,096,953

MECHANISM TO TRANSFER WORKPIECES BETWEEN LOCATIONS

Arnold LeRoy Kellermann, Goshen, and David Ian McDonald, Cincinnati, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Mar. 21, 1977, Ser. No. 779,732
Int. Cl.[2] B65G *47/91*
U.S. Cl. 214—1 BT **37 Claims**



1. A machine for transferring a workpiece substantially horizontally from a first location to a second location comprising

a machine frame;

a four bar mechanism with a pair of approximately vertical connecting rods between a driver link at the bottom and follower link at the top;

a workpiece engaging means supported from said follower link;

vertical driving means to substantially vertically drop then lift said four bar mechanism periodically by engaging said driver link;

constraining means supported from said frame to guide said four bar mechanism to move in a substantially vertical path relative to said frame; and

horizontal driving means supported from said frame to substantially horizontally oscillate said follower link from one of said drop and lift positions at one said location to one of said positions at the other said location and return;

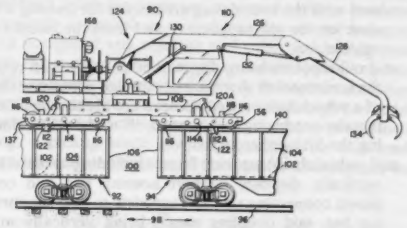
both said vertical and horizontal driving means operating in timed relation to each other to vertically lift said four bar mechanism sufficiently for a workpiece at said first location to be engaged by said workpiece engaging means before substantial oscillation to said second location has occurred.

4,096,954

GONDOLA CAR LOADER

Walter E. Buckner, Hartselle, Ala., assignor to Lucky Manufacturing Company, Huntsville, Ala.

Filed Apr. 22, 1977, Ser. No. 789,887
Int. Cl.[2] B65G *67/00*
U.S. Cl. 214—38 CC **9 Claims**



3. An apparatus moveable along the length of a plurality of railroad gondola cars positioned end to end comprising:

a chassis; and

means for supporting said chassis on upper edges of the walls of the cars and for facilitating movement of the chassis across gaps between immediately adjacent cars, said means comprising:

a first pair of elongated beams mounted to a forward portion of said chassis, each of said first pair of elongated beams carrying a plurality of wheels spaced along the length thereof for engaging the upper edges of the walls of the cars, and each of said beams being selectively pivotable in a substantially vertical plane with respect to the chassis at a point intermediate two of said plurality of wheels about an axis generally perpendicular to the length of the beam; and

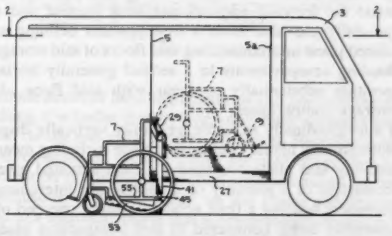
a second pair of elongated beams mounted to a rearward portion of said chassis, each of said second pair of elongated beams carrying a plurality of wheels spaced along the length thereof for engaging the upper edges of the walls of the cars, and each of said beams being selectively pivotable in a substantially vertical plane with respect to the chassis at a point intermediate two of said plurality of wheels about an axis generally perpendicular to the length of the beams.

4,096,955

LIFTING MECHANISM

Nolan Dake, 378 Connaught Way, Houston, Tex. 77015

Filed Sep. 10, 1976, Ser. No. 722,007
Int. Cl.[2] B60P *1/44*
U.S. Cl. 214—75 G **6 Claims**



1. In a lifting and lowering apparatus for wheelchairs and the occupants thereof to and from a motor vehicle comprising:

a supporting strut means vertically disposed within the vehicle,

an articulating arm means operatively interconnected to said supporting strut means for moving vertically with respect thereto,

a wheelchair support frame supported from the remote end of the articulated arm means and including a pair of rail supports for supportively receiving the rails of a wheelchair and,

motive power means and lifting means operatively associated with the articulating arm means for moving a wheelchair on the rail supports to and from the interior of the vehicle and,

said rail supports being disposed at an angle with respect to the horizontal so that the ends thereof proximate the front of a wheelchair carried thereon are higher than the back, thereby producing a backward tilt to the wheelchair during the lifting thereof,

said wheelchair support frame including a substantially vertically disposed support housing bar, and coupling means connecting said rail supports to said support housing bar, said coupling means being vertically movable toward said articulating arms upon actuation thereof so as to move the wheelchair on the ground and thus tilt it rearwardly prior to operation of said articulating arm means.

4,096,956

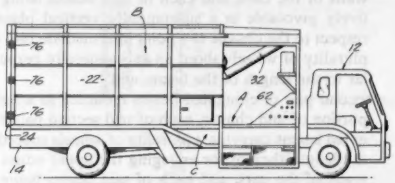
REFUSE VEHICLE

Raymond Lester Gaskin, 809 Valley Crest, La Canada, Calif. 91011

Continuation of Ser. No. 592,349, Jul. 1, 1975, abandoned. This application Jan. 26, 1977, Ser. No. 762,401

Int. Cl.[2] B60P *1/00*; B65F *3/00*

U.S. Cl. 214—82 **4 Claims**



1. An apparatus adapted to be mounted upon a vehicle chassis rearwardly of the cab thereof for loading and compacting compressible material comprising:

(a) a refuse loading compartment disposed rearwardly of the cab having a floor and side walls;

(b) a forwardly open storage compartment disposed rearwardly of said loading compartment and in open communication therewith having side walls, a substantially vertically disposed end wall and a floor elevated with respect to the floor of said loading compartment;

(c) a generally planar member disposed intermediate said loading and storage compartments said member being pivotally connected to said storage compartment proximate the forward edge of said floor thereof and being pivotally movable from a first position defining an inclined plane interconnecting said floors of said storage and loading compartments to a second generally horizontal position substantially coplanar with said floor of said storage compartment;

(d) a longitudinally movable, generally vertically disposed, substantially planar compaction blade including means for moving said blade comprising a fluid actuated assembly consisting of a plurality of telescopically interconnected members housing a fluid actuated piston, one end of said assembly being connected to said compaction blade for uniform movement of said blade, the other end of said assembly being connected to the forward end of the loading compartment, said compaction blade being movable relative to said planar member from a first position forward of the forward edge of said planar member wherein said blade closes the forward opening in said storage compartment, to a second position proximate said rearward end wall of said storage compartment said blade being constructed and arranged to cooperatively interact with said planar member for removing refuse from said planar member when the latter is in a second position and carrying the refuse rearwardly of said planar member and storage compartment toward the end wall thereof for compaction of the trash between said compaction blade and said end wall;

(e) a pusher assembly carried within said loading compartment and reciprocally movable rearwardly beneath said compaction blade to a position proximate said planar member for moving refuse deposited into said loading compartment onto said planar member when said latter member is in a first position, said pusher assembly being provided with a curved refuse engaging blade adapted to cooperate with said planar member to lift the trash deposited thereon as said member is raised to said second position, the curvature of said blade closely corresponding to the arc generated by the movement of the forward edge of said planar member as said member moves from said first to said second position, whereby as said member is moved to said second position said blade and said planar member cooperatively interact so that as the trash is lifted it will not fall between said blade and said planar member; and

(f) means for moving said planar member from the first to second postion.

4,096,957

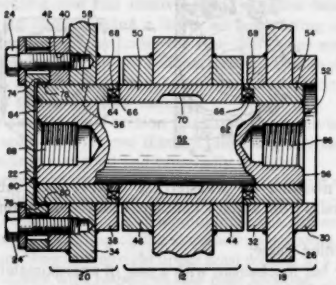
PIVOT PIN ASSEMBLY

Lowell P. Iverson, Aurora; George W. Dirscherl, Chicago, and Paul D. Hagen, Yorkville, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 18, 1977, Ser. No. 816,579

Int. Cl.[2] B23P *19/04*

U.S. Cl. 214—145 R **6 Claims**



1. In a loader bucket having a bucket bracket assembly secured thereto and mounted for rotation about a loader arm assembly of an earth-working implement, an improved pivot pin assembly for mounting the bucket brackets to the loader arm assembly comprising:

an elongated cylindrical pin having a first end face and a second end face;

a first retaining sleeve having an inner surface and an outer surface and an interior end and an exterior end, the inner surface engaging the cylindrical pin, the exterior end of said first sleeve being secured to the first end face of the elongated cylindrical pin, the outer surface of the sleeve engaging the bucket bracket assembly of the loader bucket;

a second retaining sleeve having an inner surface and an outer surface and an interior end and an exterior end, the inner surface engaging the cylindrical pin, the exterior end of the second sleeve being secured to the second end face of the elongated cylindrical pin, the outer surface of the

sleeve engaging the bucket bracket assembly of the loader bucket, flange means extending outwardly from the exterior end of the second retaining sleeve for abutting the bucket bracket assembly, the flange means defining two spaced-apart sides;

a sleeve bearing having an inner bearing surface engaging the cylindrical pin and an outer surface engaging the loader arm assembly, the sleeve bearing captured between the interior surface of the first and the second retaining sleeves; and

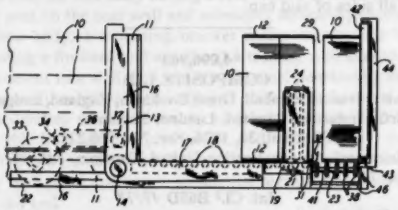
a cover plate mounted on the bucket bracket assembly having a channel for capturing the flanges between the cover plate and the bucket bracket assembly for restricting axial movement of the elongated cylindrical pin, and said two spaced-apart sides retained in the channel for restricting rotational movement of the elongated pin with respect to the loader bucket.

4,096,958

METHOD FOR HANDLING BUNDLES OF SHEETS

Walter John Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Division of Ser. No. 663,825, Mar. 4, 1976, Pat. No. 4,018,351.
This application Feb. 14, 1977, Ser. No. 768,106
Int. Cl.[2] B21C *47/24*
U.S. Cl. 214—152 **2 Claims**



1. A method for automatic depalletizing rows of bundles of sheets from a pallet which is in a prone position with the bundles of sheets lying thereon on top of each other, comprising the steps of bringing a common vertical side of the pallet and bundles of sheets into contact with a vertical arm, tipping the said arm and pallet and the bundles of sheets to an upright side-by-side position and thereby positioning the bundles onto inclined anti-friction members on said arm and thereby present upstanding rows of said bundles of sheets, moving all of said rows of said bundles of sheets in a first direction along a first conveyor which thus moves all of the rows of said bundles by gravity along said anti-friction members as a unit away from said pallet which remains stationary, holding some of said rows of said bundles of sheets on said first conveyor while passing one of said rows of said bundles of sheets to a second conveyor, moving said one row of said bundles of sheets on said second conveyor in a direction transverse to the movement of said rows of said bundles of sheets relative to said first conveyor and thereby moving said one row of said bundles of sheets along the length of said one row and on said second conveyor, and dispersing individual bundles of the sheets to different locations.

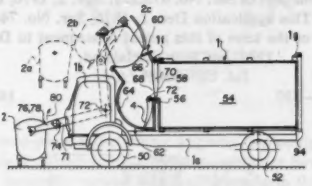
4,096,959

GARBAGE COLLECTING AND TRANSPORT VEHICLE

Georg Schaffler, Augsburg, Germany, assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Germany

Filed Oct. 7, 1976, Ser. No. 730,315
Claims priority, application Germany, Oct. 8, 1975, 2545051
Int. Cl.[2] B65F *3/02*
U.S. Cl. 214—302 **9 Claims**

1. A garbage collecting and transport vehicle for loading garbage from a garbage can or similar container, comprising a wheeled chassis having a driver's cabin at one end of said chassis, a removable garbage receiving container adapted to be positioned on said chassis having one end with a garbage receiving opening facing toward the driver's cabin, a garbage loading housing mounted on said chassis adjacent said cabin and having a top with a garbage receiving opening and an end opposite to the end facing said driver's cabin with a transfer opening adapted to align with the garbage receiving opening for the transfer of garbage from the garbage loading housing to said garbage receiving container, a pivotal garbage can loader arm pivotally mounted on said chassis for pivotal movement about a horizontal axis adjacent said cabin and having means thereon for engaging the garbage can, said loader arm being pivotally movable with the garbage can through an arc extending from adjacent the ground level to said garbage can receiving opening to dump the garbage from the can into said loader housing, a pickup blade pivotally mounted on said loader housing adjacent the bottom of the transfer opening and having an end opposite the pivotal mounting extending substantially to the bottom of said loader housing, said pickup blade being pivotal to raise the garbage in the loader housing to the level of the transfer opening, a closing blade mounted on said garbage receiving container and said loader housing and being pivotally mounted adjacent the top of said transfer opening and being of a length to extend substantially to the bottom of the transfer opening and the inlet of said receiving container, said closing blade being pivotal to a position spaced from the transfer opening in a direction toward the garbage receiving opening so as to permit the pickup blade to lift the garbage dumped into the housing so as to place it in alignment with the transfer opening, said closing blade being pivotal backwardly toward the transfer opening to deflect the garbage off the pickup blade and to move it through the transfer opening into the garbage receiving container.

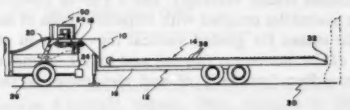


4,096,960

HAYSTACK MOVER CONTROL MEANS

Charles L. Gilmore, P.O. Box 231, Sterling, Kans. 67579

Filed Apr. 26, 1977, Ser. No. 790,958
Int. Cl.[2] B60P *1/28*
U.S. Cl. 214—505 **9 Claims**



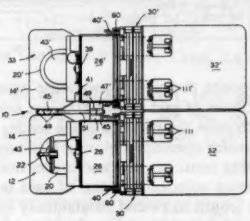
1. Mobile material handling apparatus and controls therefor, comprising a wheeler trailer, hydraulic fluid actuated means mounted on the trailer for handling material, electrically operated valves mounted on said trailer for controlling hydraulic fluid actuation of the hydraulic fluid actuated means, an internal combustion engine mounted on the trailer and drivingly coupled to a hydraulic pump that is operationally connected to said valves, said trailer being provided with fifth-wheel towing vehicle coupling means at its forward end, said engine including electrically operated components, electrical control means for said valves and for said components, said control means including an array of electric switches and an elongated flexible multiconductor electric cable having its conductors at one

end thereof operatively connected to the valves and the engine components and having its conductors at its other end operatively connected to said array of switches, said cable having a length such as to be extendible to position its said other end forwardly of the fifth-wheel coupling means, whereby the valves and the engine components can be controlled from a position remote from both the valves and the engine, and said electrically operated components including an ignition system therefor, and an electric starter therefor, whereby the engine, even when cold, can be started and stopped from said remote position.

4,096,961
DUAL LOW LIFT TRUCK

Jack O. Rocco, Burlington, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation-in-part of Ser. No. 673,221, Apr. 2, 1976, Pat. No. 4,065,012. This application Dec. 2, 1976, Ser. No. 746,908
The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.
Int. Cl.² B60P *1/04*
U.S. Cl. 214—510 **14 Claims**



1. In a dual low lift powered truck, a tractor drive portion having a main frame, a tractor non-drive portion having a main frame, coupling means connecting said tractor portions in side-by-side relation for operation as a single dual unit truck, hydraulic actuator means and guide means supported from and rearwardly of the forward end portion of each of said main frames, vertical guide means supported from a forward end portion of each of said frames, a pair of relatively short L-frame assemblies having a horizontal leg portion extending beneath and forwardly of respective ones of said main frames and a corresponding vertical leg portion actuatable by said hydraulic actuator means for guided vertical movement, a pair of elevatable load wheel means and actuator assemblies connected to respective ones of said L-frame assemblies and cooperating with said hydraulic actuator means to raise and lower said L-frames bodily vertically, and a pair of relatively long L-frame assemblies coupled with respective ones of said vertical guide means for guided vertical movement in at least a portion of the movement thereof, said long L-frames overlapping, extending forwardly of and elevatable by said short L-frames.

4,096,962
RING OPENER FOR HERMETICALLY SEALED MOLDED PLASTIC CONTAINERS

Arduino E. Riuli, Wayne, and Bernard F. Kopacz, Little Falls, both of N.J., assignors to Becton, Dickinson and Company, Rutherford, N.J.

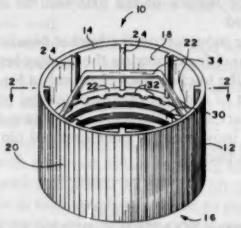
Filed Aug. 1, 1977, Ser. No. 820,584
Int. Cl.² B65D *1/02*
U.S. Cl. 215—32 **3 Claims**

1. A ring-type opener for a plastic container having an integrally molded, hermetically sealed, bulbous cap portion, which comprises;

a cylindrical ring member open at first and second ends and having a bore therethrough communicating between the open ends;

threads on the wall of said bore adjacent said first end, adapted to mate with threads on said plastic container immediately beneath said cap portion;

retainer means attached to said cylindrical member and partially closing said second end; and

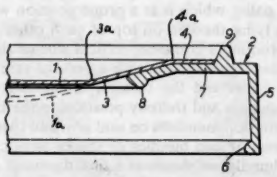


chisel means mounted on the walls of said bore above said threads and extending towards said second open end at an angle so as to engage with the underside of said bulbous cap portion of the container when said cylindrical member is mounted thereon, said engagement being uniform on all sides of said cap.

4,096,963
COMPOSITE LID

Kenneth Francis Rumball, Great Bookham, England, assignor to Airfix Industries Limited, London, England

Filed Jul. 30, 1976, Ser. No. 710,222
Claims priority, application United Kingdom, Jul. 30, 1975, 31954/75
Int. Cl.² B65D *41/18*
U.S. Cl. 215—317 **1 Claim**



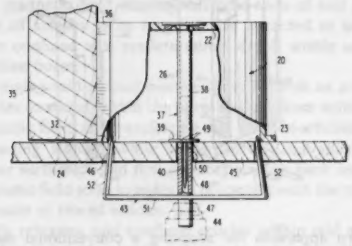
1. A composite lid of given form comprising a blank of flexible sheet material and a peripheral moulding of synthetic plastics material injection moulded in position on the blank and of form following the periphery of the blank, the blank comprising a generally planar central part, an inner marginal part displaced relative to the central part to extend from an inner junction with the central part out of the plane of said central part in a first direction and a generally planar outer marginal part which extends outwardly from an outer junction with the inner marginal part in a plane substantially parallel with and spaced from the plane of said central part, said planar outer marginal part terminating in a free edge part, the moulding comprising an inwardly extending portion abutting and bonded by moulding in position on the blank to the displaced marginal parts of the blank on the faces thereof which are directed away from said first direction, said moulding extending outwardly beyond the free edge part of said blank, said moulding including an integral skirt extending from the outwardly extending part of said moulding in a direction opposite to said first direction, the inwardly extending portion of the moulding overlying the outer junction between the inner and outer marginal parts of said blank but not the inner junction between the inner marginal part and the central part.

4,096,964

UNIVERSAL ELECTRICAL OUTLET BOX AND METHOD OF INSTALLING

Earl Glick, 13015 Lincoln St., NW., Massillon, Ohio 44646

Filed Jun. 3, 1977, Ser. No. 803,364
Int. Cl.[2] H02G 3/08
U.S. Cl. 220—3.4 11 Claims



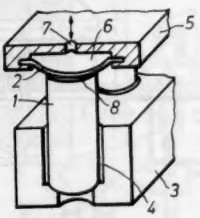
5. An electrical outlet box and installation means comprising a substantially cylindrical outlet box body having an open forward end and a flat annular flange adjacent the open forward end, the box body having a rear wall, a central threaded axial post on the rear wall and extending forwardly thereof in the box body, a mounting bracket means on the box body including a forward end apertured attaching web adapted for securement to a wall stud, a dry wall panel penetrating means temporarily telescopically engaged with said threaded post and extending axially forwardly of the post and being readily separable from the post after usage, and a rotary cutter means adapted to be centered on the penetrating means for producing a dry wall panel opening in substantial registry with said open forward end.

4,096,965

STORAGE DEVICE FOR SAMPLE CONTAINERS

Werner Lessnig; Günter Metz, both of Cologne; Willi Spiegel, and Jürgen Fleischer, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 17, 1976, Ser. No. 724,199
Claims priority, application Germany, Oct. 4, 1975, 2544533
Int. Cl.[2] A47B 73/00; B65D 53/00
U.S. Cl. 220—20 1 Claim



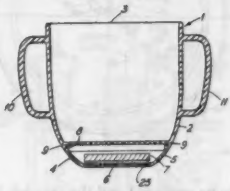
1. A device for the storage of sample containers comprising: a holder having a plurality of cavities therein, each cavity receptive of a sample container having a portion projecting outwardly therefrom; a common cover for all of the received sample containers and positionable over the holder and on the projecting portions of the containers to float thereon unsupported by the holder; and means coactive with said cover when disposed in position over the holder and unsupported thereby for individually sealing each sample container simultaneously, wherein the means for sealing comprises a cavity in the cover, an elastic inflatable membrane disposed on the underside of the cover in the cavity deformable outwardly into sealing engagement with the received sample containers and retractable into the cavity to release the sealing engagement.

4,096,966

SELF-RIGHTING CUPS

Marvin Stanley Korshak, 1738 Montemar Way, San Jose, Calif. 95125

Continuation-in-part of Ser. No. 598,235, Jul. 23, 1975, abandoned. This application May 20, 1976, Ser. No. 688,141
Int. Cl.[2] B65D 11/00
U.S. Cl. 220—69 5 Claims



1. A two-piece self-righting drinking cup comprising a generally rigid cylindrical hollow cup container having a downwardly inwardly curved side wall of uniform thickness and a bottom wall which is for the reception and retention of a liquid, a separate base member which is circular in cross section and on which the hollow cup container is mounted, means for mounting said cup container on said base member, said base member being rigid and having a convex outer surface progressively decreasing in diameter from the junction of said base member and said hollow cup member to the lowermost portion of said base member, said lowermost portion defining a flat bottom the diameter of which is at least 39% of the greatest external diameter of the hollow cup container, said base member having a structure including an enclosed compartment containing ballast, said ballast having a center of gravity which lies on a vertical axis extending through the center of said cup container, wherein said self-righting drinking cup is characterized by the following critical parameters:

(a) the ratio of the diameter of the lowermost portion of the base to the greatest diameter of the drinking cup itself is about 0.39 to 0.75,

(b) the ratio of cup height to maximum cup diameter is about 0.80 – 1.1,

(c) the ratio of the cup height to the diameter of the lowermost portion of the base is about 1.3 to 2.5, and

(d) the ratio of cup height to the height of the convex portion of the base member is about 1.8 to 3.2.

wherein said self-righting drink cup resists being knocked over but quickly self right itself without any substantial subsequent wobble after being knocked over.

4,096,967

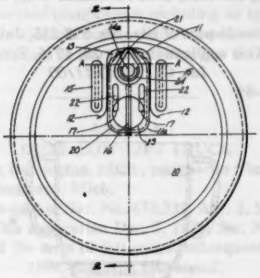
ECOLOGICAL EASY-OPEN CAN END

Elton George Kaminski, Sidney, Ohio, assignor to The Stolle Corporation, Sidney, Ohio

Filed Jun. 6, 1977, Ser. No. 803,514
Int. Cl.[2] B65D 41/32
U.S. Cl. 220—269 3 Claims

1. In an easy-open can end having a primary score defining a tear tab, an integral rivet in said score, and a pull tab secured to said can end by means of said rivet, said primary score being generally U-shaped with the open end of the U toward the center of the can end, the ends of the U being flared outwardly, and the parallel arms of the U being spaced very slightly further apart than the width of said pull tab, said tab having a penetrating nose disposed over the bottom center of the U; stiffening beads embossed in said can end, one on each side of said pull tab and parallel thereto, and extending slightly in front of said rivet, and a substantial amount behind said rivet,

and an axial bead debossed in said can end extending behind said rivet to a point beyond the end of said pull tab, whereby when said pull tab is raised to a vertical position, said penetrating nose ruptures said primary score, whereupon downward pressure on said vertical pull tab causes the remainder of said



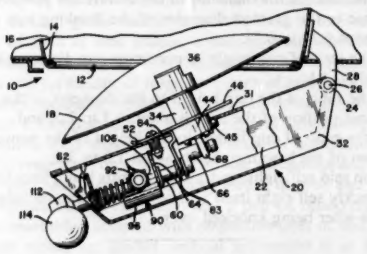
primary score to be ruptured and the tear tab to be bent downwardly below the can end, and said tab may then be bent forwardly and snapped under the opened edge of said can end, the entire tear strip and pull tab being thus disposed below said can end.

4,096,968

DOOR MOUNTING AND ACTUATOR FOR A PRESSURE VESSEL

Fritz F. Treiber, Centerville, and Francis E. Graham, Kettering, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Sep. 16, 1977, Ser. No. 833,720
Int. Cl.[2] B65D *45/28*
U.S. Cl. 220—314 **12 Claims**



1. Apparatus for mounting and actuating a closure door of a pressure vessel, comprising:

an elongated door support member positionable across the vessel opening and pivotally supported adjacent said opening to swing toward and away from said opening;

a rotationally and axially movable shaft mounted lengthwise on said door support member;

cam and follower means operably associated with said shaft and said door support member for moving said shaft axially in response to rotation thereof; and

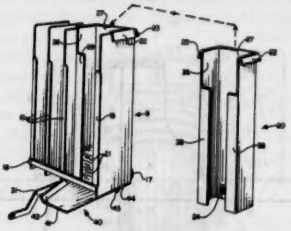
coupling means connecting said shaft to the door and responsive to axial movement of said shaft for shifting the door laterally with respect to said door support member and for causing translational movement of the door toward and away from said door support member in response to shaft rotation.

4,096,969

CIGARETTE DISPENSER ADAPTER

Anthony Ragusa, 4916 Rye St., Metairie, La. 70002

Filed May 9, 1977, Ser. No. 794,931
Int. Cl.[2] B65H *31/20*
U.S. Cl. 221—199 **10 Claims**



1. An apparatus for adapting a conventional mechanical cigarette vending machine having a magazine for dispensing shorter cigarettes to dispense longer cigarettes, said magazine having a series of vertical divider means for holding cigarettes, said apparatus comprising:

a. a generally elongated, rectangular sleeve means having a flat back means;

b. two flat, rectangular side panel means extending approximately perpendicularly on the same side of said back panel means and being connected thereto;

c. lip means connected to the top of said sidewall means for connecting said apparatus to said dividers; and

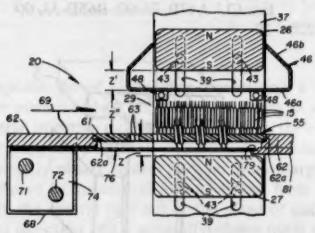
d. front panel means connected to and extending from said side panel means to contain said longer cigarettes within said sleeve means.

4,096,970

METHODS OF AND APPARATUS FOR HANDLING ARRAYS OF PARAMAGNETIC ARTICLES

Kenneth L. Wyatt, Oklahoma City, Okla., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,116
Int. Cl.[2] B07C *1/06*
U.S. Cl. 221—264 **41 Claims**



1. A method of successively loading a predetermined number of elongated paramagnetic articles out of a mass thereof, wherein the articles of the mass are initially stored in parallel relationship within a magnetic field, into precisely spaced arrays for subsequent transfer to an unloading station, whereat each array of articles is unloaded into an aligned array of receiving areas of an associated workpiece, comprising the steps of:

maintaining the mass of stored articles temporarily within said magnetic field such that said articles have one of their respective ends in contact initially with a smooth planar surface of a first non-magnetic but field transparent member portion positioned within and at least substantially perpendicular to the established lines of magnetic force;

advancing said first planar member portion beyond the influence of said magnetic field such that a second non-magnetic but field transparent member portion is positioned within said field, said last mentioned portion constituting at least an associated coplanar extension of said first member portion, and being formed with a predetermined array of article-receiving and selectively-confining bores, the advancement of said second member portion within said magnetic field causing different ones of said stored mass of articles to be magnetically attracted to and initially confined at a predetermined depth within said respective bores;

withdrawing said second member portion with an array of articles confined within the bores thereof from within said magnetic field, and transferring said array of articles to the unloading station, while simultaneously advancing the planar surface of said first member portion back into said magnetic field so as to again be in contact with the remaining mass of stored articles, and

actuably releasing said confined articles within said respective bores at said unloading station so as to allow them to fall, at least in part by gravity, into respectively aligned article-receiving areas of an associated workpiece positioned therebeneath.

4,096,971

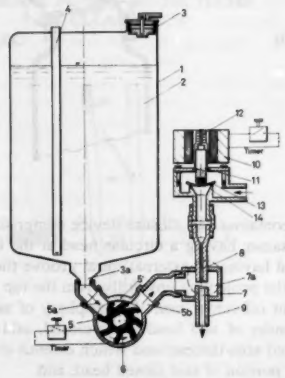
METHOD OF AND APPARATUS FOR DISPENSING SELF-CONSERVING LIQUIDS

Alexander Kückens, Hamburg, Germany, assignor to Dagma GmbH & Co. Deutsche Automaten- und Getränke - Maschinen, Reinfeld, Holstein, Germany

Continuation of Ser. No. 560,798, Mar. 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 536,592, Dec. 26, 1974, abandoned. This application Sep. 30, 1976, Ser. No. 728,170

Int. Cl.² B67D *5/56*

U.S. Cl. 222—1 **12 Claims**



10. A method of dispensing liquids, comprising admitting a high-viscosity first liquid into a mixing chamber; directing a less viscous second liquid into said mixing chamber via a supply opening therefor; mixing said first and second liquids in said mixing chamber to form a product liquid; withdrawing said product liquid from said mixing chamber via an outlet opening therefor; terminating said directing; continuing said admitting for such a period subsequent to termination of said directing that said outlet opening becomes sealed by a quantity of said first liquid; and thereafter terminating said admitting.

4,096,972

APPARATUS FOR THE SELECTIVE DELIVERY OF PORTIONS OF A FLUID MEDIUM

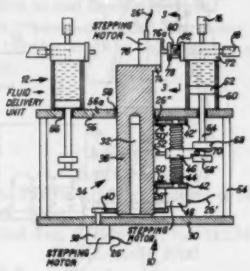
Hermann Bartels, Binningen; Fritz Gallati, Zurich; Karl Lang, Uerikon, and Heinz Rutishauser, Greifensee, all of Switzerland, assignors to Mettler Instrumente AG, Greifensee-Zurich, Switzerland

Filed Dec. 20, 1976, Ser. No. 752,601

Claims priority, application Switzerland, Feb. 6, 1976, 1459/76

Int. Cl.² B67D *5/60*

U.S. Cl. 222—135 **8 Claims**



5. An apparatus for the selective delivery of portions of fluid, comprising:

a plurality of fluid delivery units, each fluid delivery unit including a respective conveyor means for conveying fluid to be delivered, said fluid delivery units being stationarily arranged along a circle having an axis, each delivery unit including a multi-way valve for controlling flow of fluid into and from its associated delivery unit;

a journalled member arranged along said axis;

valve actuating means common to said multi-way valves and carried by said journalled member for actuating a selected multi-way valve;

means common to said fluid delivery units and carried by said journalled member for actuating the conveyor means of said fluid delivery units;

means for connecting said actuating means to the conveyor means; and

electrically operated drive means connected to said journalled member for rotating said journalled member about said axis to selectively locate said actuating means and connecting means in a position for actuation of a selected fluid delivery unit.

4,096,973

PORTABLE SEALANT APPLICATOR

John C. Checko, 5 Northern Dr., Bridgewater, N.J. 08807

Filed Mar. 17, 1976, Ser. No. 667,863

Int. Cl.² B67D *5/62*

U.S. Cl. 222—146 HE **9 Claims**

1. Apparatus for heating and extruding flowable sealant material onto a work surface comprising:

a portable feed chamber having an opening for receiving sealant material in bulk form and an outlet for supplying sealant material in a fluid state to a pump device;

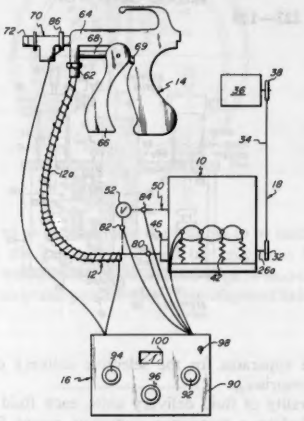
first heating means disposed with respect to said feed chamber for heating the bulk sealant material contained therein to a fluid state having a pumpable viscosity;

conveyor means disposed within said feed chamber for forcing said fluid sealant material through said outlet of said feed chamber under pressure into said pump device;

said pump device being disposed outside of said feed chamber with respect to said outlet for forcing the fluid sealant material under pressure through a heated hose, said pump device including second heating means for maintaining the sealant material passing therethrough at a predeter-

mined temperature level; said pump device further including a rotor and a stator and being of the positive displacement type having progressing cavities formed as the rotor turns within the stator;

said heated hose being connected to said pump device for receiving fluid sealant material supplied therefrom under pressure, said heated hose including third heating means for maintaining the sealant material passing therethrough in a fluid state;



feedback means connected between said pump device and said heated hose for returning fluid sealant material to said feed chamber when the pressure in said heated hose reaches a predetermined level, said feedback means including fourth heating means for maintaining the sealant material passing therethrough in a fluid state; and

means connected to said heated hose for applying said fluid sealant material onto a work surface.

4,096,974

COVER ASSEMBLY FOR SPRAY CANS

Terry M. Haber, 3050 S. Bristol #8C, Santa Ana, Calif. 92707, and James G. P. Dehlsen, 1740 Plaza del Norte, Balboa, Calif. 92661

Filed Mar. 11, 1977, Ser. No. 776,583
Int. Cl.[2] B65D *83/14*
U.S. Cl. 222—402.13 **7 Claims**

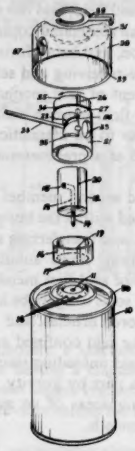
1. A cover assembly for spray cans including, in combination:

(a) a rotatable sleeve receivable over the normal discharge valve and nozzle on said spray can and having a discharge port in its side wall positionable to register with said discharge nozzle when rotated to a first position;

(b) a flexible hose connected to said discharge port;

(c) a cup shaped cover positioned over said sleeve and locked against rotation to said spray can, said cover having a side wall opening in alignment with said discharge nozzle through which said flexible hose extends; and

(d) means passing through the top of the cup shaped cover to effect engagement and opening of said discharge valve whereby fluid from said can is discharged through said flexible hose for accurate directing of the fluid and whereby said sleeve can be rotated to a second position to cause said flexible hose to be withdrawn through said side wall opening and wrapped around said sleeve in the annular space between the exterior of said sleeve and the interior of said cover to thereby store said flexible hose when not in use.

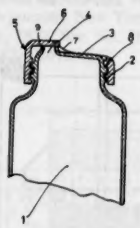


4,096,975

CONTAINER

Mureo Furukawa, 8-2-22, Shakujiidai, Nerima-ku, Tokyo, Japan

Filed Jan. 17, 1977, Ser. No. 759,626
Claims priority, application Japan, Jan. 21, 1976, 51-4697[U]
Int. Cl.[2] B67D *3/00*
U.S. Cl. 222—552 **12 Claims**



1. A container and closure device comprising:

a container having a circular head at the top thereof, said head having an external spiral groove therein;

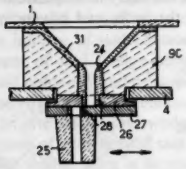
an outlet projecting upwardly from the top of said head at a point off-center near the periphery of said head, the remainder of said head being closed, said outlet having a raised area therearound which extends above the remaining portion of said closed head; and

a cap having an opening therein, a closure means which is engagable with said raised area to close said outlet of said head, and an internal spiral groove for engaging said external spiral groove of the said container, said closure means of said cap opening and closing said outlet of said head by turning of said cap relative to said container, said opening of said cap being at least partly in registration with said outlet of said head when said cap is in an open position on said container and said closure means being in engagement with said raised area when said cap is in a closed position on said container.

4,096,976
VESSELS FOR TRANSFERRING LIQUID METAL HAVING A REMOVABLE INSULATING LINING

Henri Jean Daussan, Longeville-les Metz, France, assignor to Daussan et Compagnie, Metz, France

Filed Jun. 18, 1976, Ser. No. 697,633
Claims priority, application Luxembourg, Jun. 30, 1975, 72865
Int. Cl.[2] B22D 41/02
U.S. Cl. 222—591 5 Claims

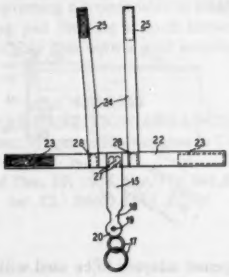


1. A vessel for transferring liquid metal and having pouring holes, said vessel having lateral walls and a bottom provided with a permanent lining of refractory material, wherein the permanent lining is covered with a removable heat-insulation lining formed of inorganic particles embedded in a binder, said inorganic particles being sinterable at the temperature of the liquid metal which is intended to be introduced into said transfer vessel, and wherein the vessel pouring holes are fitted with a detachable internal lining of insulating material which is also sinterable in contact with the liquid metal, said detachable internal heat-insulating lining being inserted between said removable heat-insulating lining covering the permanent refractory lining provided on the bottom of the vessel and said permanent refractory lining adjacent to the pouring hole.

4,096,977
DEVICE FOR ANCHORING BOTTLES OR THE LIKE, AND METHOD

George W. Barville, 268 Sheffield La., Glen Ellyn, Ill. 60137, and Joel R. Peterson, Sr., 5542 S. Natoma, Chicago, Ill. 60638

Filed Aug. 24, 1976, Ser. No. 717,345
Int. Cl.[2] A45F 3/14
U.S. Cl. 224—5 BC 10 Claims



1. A device especially suitable for anchoring an object such as a baby bottle or the like to a body encircling harness, comprising:

an elongate flexible element having a neck portion and opposite ends, one end being adapted for attachment to the harness and the opposite end having a terminal eye with an eyehole therein;

a resiliently flexible retaining ring of larger diameter than said eyehole;

said terminal eye being adapted for projection through the ring so that the ring encircles said neck portion;

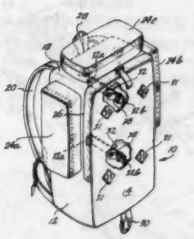
said ring being compressible to collapse it, after it encircles said neck portion, to a small enough elongated dimension to pass through said eyehole, with one end of the collapsed ring engaging a part of said neck portion adjacent to said terminal eye and the opposite end of the collapsed ring providing a leading tip for guiding the collapsed ring through said eyehole to pull said neck portion part into a coupling loop and through the terminal eye, similarly as a needle passing through a fabric draws a thread through the fabric, and the ring then being permitted to expand to its ring form, and said terminal eye then engaging as a ring-retaining locking collar about said neck portion adjacent said ring and said coupling loop whereby to retain the ring attached to said flexible element;

and the thus retained expanded ring being adapted to fit about and thereby attach an object such as a baby bottle to the harness.

4,096,978
BACKPACK

Frank M. Noice, Big Fork, Mont., assignor to Maran Corporation, Big Fork, Mont.

Filed Aug. 9, 1976, Ser. No. 712,741
Int. Cl.[2] A45F 3/00
U.S. Cl. 224—8 R 16 Claims



1. In a back pack including a flexible bag comprising a front, a back, sides, a top and a bottom, for containing a load to be packed and shoulder straps attached to and extending forwardly from the front of the bag, the improvement comprising means to adjust the interior volume of said flexible bag including an adjustable length connection means extending across the interior of the bag and interconnecting the front and rear thereof at locations spaced inwardly from the sides, the top, and the bottom such that the effective interior volume of said bag can be varied by adjusting the length of said connection means thereby drawing said locations on said front and said back together.

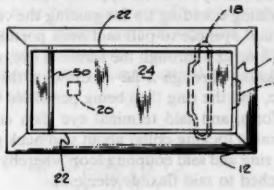
4,096,979
BELT BUCKLE KNIFE

Walter W. Collins, Rock Hill, S.C., assignor to Robert W. Brewer, Jr., Rock Hill, S.C.

Filed Nov. 22, 1976, Ser. No. 743,595
Int. Cl.[2] A45C 11/00
U.S. Cl. 224—26 B 12 Claims

1. A combination belt buckle and knife comprising a base member having a recess therein, means on said base member for attaching opposite ends of a belt thereto, a cover plate for said base member recess, means for removably attaching said cover plate to said base member in overlying relation with said recess, a knife blade, and means mounting said knife blade on the inside face of said cover plate for movement between a first position overlying the inside face of said cover plate whereby said knife blade is receivably concealed within said recess of

said base member when said cover plate is attached to said base member, and a second position extending outwardly from said



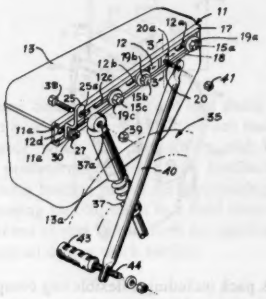
cover plate whereby said cover plate upon removal from said base plate serves as a handle for said knife blade.

4,096,980

UNIVERSAL MOUNTING MOTORCYCLE SADDLEBAG BRACKET

William E. Clow, Los Alamitos, Calif., assignor to Kimstock, Inc., Santa Ana, Calif.

Filed Feb. 14, 1977, Ser. No. 772,449
Int. Cl.[2] B62J *11/00*
U.S. Cl. 224—39 **5 Claims**



1. A bracket assembly for mounting a saddlebag on a motorcycle comprising:

an elongated bar member, said bar member having a flat back portion and a front portion formed by a pair of strips running substantially parallel to said back portion with a slot being formed between each of said strips and said back portion, said slots forming a C-shaped track,

a flat headed "T" bolt having its head portion supported in said slots for adjustable positioning along said track;

means for attaching said bar member to the saddlebag;

bracket means mounted on said bar member and spaced along the track from the flat headed bolt for attaching the bar member to a first portion of the motorcycle; and

strut means attached at one end to said flat headed bolt and at the other end to a second portion of the motorcycle, the head portion of said flat headed bolt being adapted to be adjustably positioned along said track to an optimum position for supporting the saddlebag on the motorcycle.

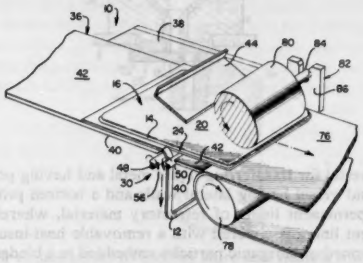
4,096,981

APPARATUS FOR STRIPPING A CONTINUOUS WEB OF MATERIAL FROM THE MARGINAL EDGE OF A BODY

Sam Martorano, Des Plaines, Ill., assignor to Wilson Jones Company, Chicago, Ill.

Filed Mar. 18, 1977, Ser. No. 779,002
Int. Cl.[2] B26F *3/02*
U.S. Cl. 225—99 **3 Claims**

1. An apparatus for use in stripping a continuous web of severable material from at least along a portion of the marginal edge of a body comprising supporting means having a receiving surface upon which the body with the continuous web is advanced along a predetermined path, deflecting means pivotally connected to the supporting means for assisting in directing the leading edge of the advanced continuous web vertically so as to facilitate a stripping thereof while permitting travel of the body along the path, stripping means including a pair of generally longitudinal and cooperating rollers are connected to the supporting means and positioned along the path for grabbing therebetween the vertically deflected continuous web and stripping it from the body in response to the advancement of the body along the path, and advancing means operatively



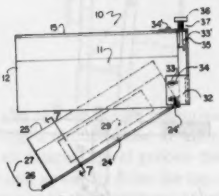
connected to the supporting means remote from the stripping means for automatically continuing the advancement of the body by pulling the body past said rollers along the path for ensuring complete tearing apart of the web from the marginal edge, said advancing means including roller means automatically vertically movable for accommodating bodies of varying thickness, and said deflecting means being comprised of an inclined and pivotally mounted plate having its free end terminate above said stripping means by a distance which serves to have such plate guide the advancing web towards and into engagement with said stripping means while permitting bodies of varying thickness to move therepast.

4,096,982

AUTOMATIC MULTI NAIL DISPENSER

Michael Stahl, Box 65, Elie, Canada

Filed Apr. 19, 1977, Ser. No. 788,760
Int. Cl.[2] B25C *1/00*
U.S. Cl. 227—113 **13 Claims**



1. A nail dispenser adapted to be used with a block of nails consisting of a plurality of rows of nails, each row containing a plurality of nails in side by side relationship adhesively secured together, said rows being adhesively secured together to form said block, each nail having a head end and an engaging end; comprising in combination a container for said nails, means to selectively separate one row of nails from the remaining row of nails and to position said separated row of nails against one side wall of container, means to urge said separated row of nails towards one end of said container, said one end being apertured to receive one end of said separated row of nails, means to limit the movement of said separated row of nails through said aperture whereby one nail projects through said aperture with the head of said nail being uppermost; tappet

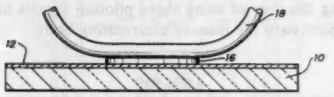
means mounted on said one end of said container and situated over said one nail whereby downward movement of said tappet engages the lower side of said tappet upon the head of said one nail and separates if from the remainder of said separated row of nails, and means to return said tappet means to the uppermost position whereby said means to urge said separated row of nails towards said one end projects a further nail through said aperture ready to be engaged by said tappet means, said means to selectively separate one row of nails from the remaining rows of nails including a wedge plate pivoted by one end thereof to one end of said container, said container including a base, a slot in said base to receive said wedge plate, downward movement of said wedge plate disengaging said wedge plate from the interior of said container through said slot, upward movement of said wedge plate engaging said wedge plate within said container and between adjacent rows of nails to separate one row from the remaining rows of nails, and magnetic means on one side of said wedge plate to maintain said plurality of rows of nails against said one side of said wedge plate when said wedge plate is in said container and maintaining said rows of nails in the upright and operative position.

4,096,983

BONDING COPPER LEADS TO GOLD FILM COATINGS ON ALUMINA CERAMIC SUBSTRATE

Loraine F. Beilein, Pinellas Park, and Frank S. Burkett, Jr., Seminole, both of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Apr. 11, 1977, Ser. No. 786,389
Int. Cl.² B23K *31/02*
U.S. Cl. 228—122 **8 Claims**



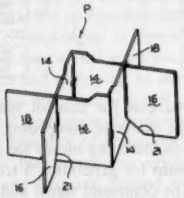
1. A process for bonding copper wire leads to gold films on alumina ceramic substrates, comprising the steps of:
(a) forming a gold die-formed head bonding pad on the gold film by thermocompressing a gold lead wire with a gold die-formed head to the gold film;
(b) removing the gold lead wire; and
(c) thermocompressing a copper wire to the gold die-formed head bonding pad forming a bond between the copper wire and the gold film with a gold interface in between.

4,096,984

INTERNAL PARTITION ARRANGEMENT

Jeffrey M. Gardner, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Dec. 19, 1977, Ser. No. 861,879
Int. Cl.² B65D *5/48, 25/04*
U.S. Cl. 229—15 **2 Claims**



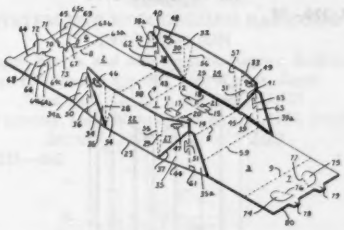
1. An internal partition, formed of a unitary blank of foldable paperboard, for providing a multi-cell arrangement within a package, comprising:
(a) a pair of first and second panel sections of substantially similar overall dimensions and each including four partition panels;
(b) each of said panel sections including a pair of intermediate panels foldably joined to each other on a common fold line but being free from attachment to the intermediate panels of the other panel section;
(c) each of said panel sections including a pair of end panels foldably joined along their inboard edges to respective outboard edges of adjacent intermediate panels along second fold lines extending parallel to said common fold line but being free from direct attachment to related end panels of the other panel section;
(d) a pair of generally triangular gussets, each being formed of material cut from a respective end panel of said first panel section;
(e) each of said gussets being foldably joined along one edge to an adjacent intermediate panel of said first panel section and being foldably joined along another edge to an adjacent end panel of said second panel section;
(f) said gussets forming the sole means of connection between the respective panel sections to permit the panels to be folded into various planes, all of which are normal to a common plane, to form a plurality of cells separated from each other.

4,096,985

ARTICLE CARRIER AND BLANK THEREFOR

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 16, 1978, Ser. No. 869,467
Int. Cl.² B65D *5/02, 75/08, 1/22*
U.S. Cl. 229—40 **18 Claims**



1. An article carrier comprising a bottom wall, a pair of side walls foldably joined respectively to the side edges of said bottom wall, a pair of overlapping top panels foldably joined respectively to the upper edges of said side walls, a securing aperture formed in one of said top panels and having a securing edge, said securing edge being disposed in diagonal relation to the side edges of said top panels, a securing tab foldably joined to the other of said top panels and disposed in said securing aperture, and the fold line between said securing tab and said other top panel being disposed in substantial coincidence with said securing edge.

4,096,986

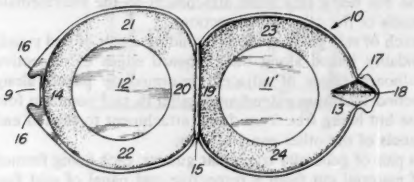
FOOD TRAY WITH INTEGRAL LOCK

John Florian, Bakersfield, Calif., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 23, 1976, Ser. No. 707,971
Int. Cl.² B65D *1/00, 5/66, 51/16*
U.S. Cl. 229—44 R **1 Claim**

1. A thermoplastic container comprising two dishlike sections which are hinged together along a common side by an integral flexible hingeline, cooperating locking means on each of said sections remove from said hingeline for releasably

locking said sections together one of said locking means on one of said sections comprising an outwardly projecting flute which terminates in an outwardly flared arrow head shaped skirt, said second locking means on said other section comprising an upwardly inclined lip on a portion of the periphery of



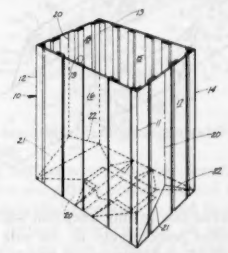
said other section, said lip having a central cut out slot adapted to receive, in locking engagement, said arrow head shaped skirt, said arrow head shaped skirt being compressed by finger action for insertion into said slot so that when said compression is released said arrow head shaped skirt expands in said slot to a locked position.

4,096,987

REINFORCED PAPER BAG

John Rodish, Ft. Wright, Ky., assignor to The Ritter Company, Cincinnati, Ohio

Filed Aug. 30, 1976, Ser. No. 718,408
Int. Cl.[2] B65D *33/02*
U.S. Cl. 229—55 **9 Claims**



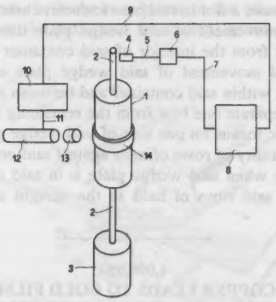
1. A reinforced bag having enhanced load carrying capacity, said bag being formed from a single ply of sheet stock cut, folded and secured to define enclosing body walls meeting at corner edges and a bottom closure, a series of relatively narrow continuous pleats extending lengthwise of the body walls and across the bottom closure at spaced apart intervals, the pleats being spaced so as to perform the major load carrying function of the bag, with each corner edge of the bag bridged by one of said pleats, and with the remainder of the pleats extending lengthwise of the body walls intermediate the corner edges, said pleats each comprising a pair of reversely folded pleat sections folded over and juxtaposed to the bag stock, said pleats being permanently secured in their folded over condition so as to provide multiple thickness areas of reinforcement for the body walls and bottom closure of the bag when the bag is expanded to its fully opened condition, thereby enhancing the strength of the opened bag so as to permit a lighter weight sheet stock to be used than would be otherwise required for a bag of the same size and carrying capacity.

4,096,988

METHOD AND AN APPARATUS FOR THE DYNAMIC BALANCING OF ROTATING BODIES, PARTICULARLY FOR CENTRIFUGES

Giovan Battista Scuricini, Rome, Italy, assignor to Comitato Nazionale per l'Energia Nucleare, Rome, Italy

Filed Dec. 14, 1976, Ser. No. 750,455
Claims priority, application Italy, Dec. 16, 1975, 52710 A/75
Int. Cl.[2] B04B *9/14*
U.S. Cl. 233—23 A **20 Claims**



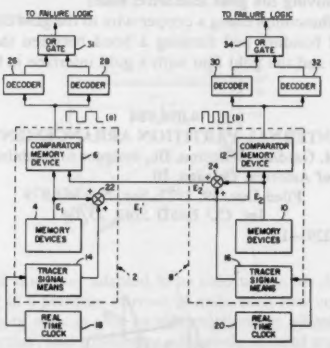
1. A method for the dynamic balancing of a rotating body, particularly a centrifuge, while it is revolving within its own frame, wherein the vibration amplitude, frequency and phase of said rotating body are sensed at least within two planes of said body, so that vibration signals are produced, which are processed and converted into piloting signals, said method comprising the step of using these piloting signals to actuate means which vary the mass of the rotating body.

4,096,989

MONITORING APPARATUS FOR REDUNDANT CONTROL SYSTEMS

David A. Tawfik, Fort Lee, N.J., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 20, 1977, Ser. No. 807,935
Int. Cl.[2] G06F *11/00*
U.S. Cl. 235—307 **8 Claims**



1. Monitoring apparatus for control systems including a plurality of redundant channels; comprising:

each of the channels including means for generating a command signal, means for generating a tracer signal, means for combining the command signal and the tracer signal, and comparator means;

the comparator means in one channel comparing the command signal generated by the command signal generating

means in the one channel to the combined command signal and tracer signal from the combining means in one of the other channels, and providing an output which toggles between the "good" and "fail" states of the comparator means in the one channel; and

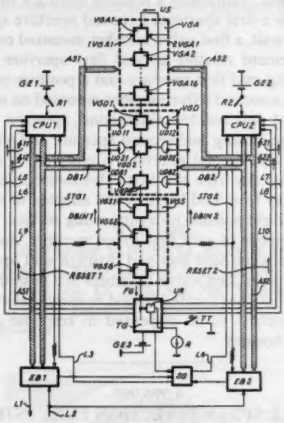
means responsive to the toggle output for providing a failure logic output.

4,096,990

DIGITAL DATA COMPUTER PROCESSING SYSTEM

Horst Strelow, Weddel, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 13, 1976, Ser. No. 752,426
Claims priority, application Germany, Mar. 22, 1976, 2612100
Int. Cl.[2] G06F *11/08*
U.S. Cl. 235—307 8 Claims



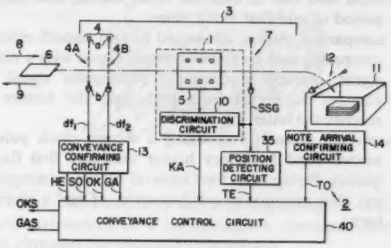
1. A data processing system comprising two computing systems receiving input data and independently operating on it, each computing system having separate microprocessing units and separate control, memory and input-output units with address, data and control signal buses, a synchronizing unit connected to said two computing systems, an address comparator unit including a first plurality of comparators connected in series and connected to the address bus of each computing system to compare associated address information, a data comparator unit including a second plurality of comparators connected in series and connected to the data bus of each computing system to compare associated data information, a control signal comparator unit including a third plurality of comparators connected in series and connected to the control signal bus of each computing system to compare associated control signal information, said address comparator unit, said data comparator unit and said control signal comparator unit connected in series, a keyable pulse current supply connected to said two computing systems and supplying an input to said series connected address, data and control signal comparator units and receiving a keyable input pulse therefrom when all of the first, second and third plurality of comparators indicate the same conditions in said two computing systems, first and second power supplies, and first and second switching means controlled by said pulse current supply to respectively connect said first and second power supplies to said two computing system to disconnect power therefrom if any of said plurality of comparators do not receive comparable information.

4,096,991

NOTE DISCRIMINATING APPARATUS

Masayuki Iguchi, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Filed May 13, 1976, Ser. No. 686,236
Claims priority, application Japan, May 13, 1975, 50-56632; May 13, 1975, 50-56631; Sep. 18, 1975, 50-112957
Int. Cl.[2] G06K *13/08*; G06F *7/02*; G06K *7/08*
U.S. Cl. 235—419 10 Claims



1. A note discriminating apparatus comprising:

detector means for detecting characteristics of a bank note;

a reference level generating means receiving the output of said detector means for generating a reference level signal; and

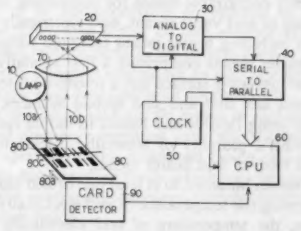
a level detecting means receiving the output of said detector means and said reference level signal from said reference level generating means for comparing the output of said detector means with said reference level signal and for generating a note discrimination signal.

4,096,992

SYSTEM FOR RECOGNIZING BAR CODE INFORMATION

Tadao Nojiri, Kariya, and Akio Sugiura, Nagoya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 11, 1977, Ser. No. 823,737
Claims priority, application Japan, Sep. 6, 1976, 51-106535
Int. Cl.[2] G06K *7/14, 9/13, 7/10*
U.S. Cl. 235—462 4 Claims



1. A system for recognizing bar code information having a plurality of parallel bars recorded in different colors and widths on an object comprising:

a light source for supplying said object with illumination light;

an image sensor having a plurality of light responsive elements aligned to be transverse to the longitudinal direction of said parallel bars, said elements being adapted to be driven one by one by a first clock pulse of a first fixed frequency and to serially produce an image signal having the peak level varying with the density of reflected light produced by said parallel bars on said object;

a sample-and-hold circuit, connected to said image sensor, for sampling the peak level of said image signal in syn-

chronization with said first clock pulse and for holding the sampled peak level of said image signal during one cycle period of said first clock pulse, thereby producing a staircase output signal which changes the signal level from one to the other in synchronization with said first clock pulse;

a smooth circuit, connected to said sample-and-hold circuit, for charging and discharging a capacitor in response to said staircase output signal, thereby producing a continuous output signal which gradually changes the signal level from said one to said the other during said one cycle period of said first clock pulse;

a comparison circuit, connected to said smooth circuit, for comparing said continuous output signal with a reference signal, thereby producing a rectangular signal which changes the signal level each time the former signal reaches the latter signal; and

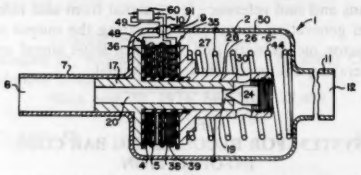
measuring means for counting a second clock pulse of a second fixed frequency higher than said first fixed frequency during each time interval of said rectangular signal, thus measuring each bar width of said a plurality of bars.

4,096,993

COMPENSATED CONTROL VALVE

Joseph L. Behr, Des Peres, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 21, 1977, Ser. No. 761,291
Int. Cl.[2] F16K *31/18*; G05D *23/20*
U.S. Cl. 236—68 B **4 Claims**



1. A temperature compensated electrically operated modulating valve, comprising:

a valve including a shell, said valve having an inlet, an outlet and valve means for regulating fluid flow between said inlet and said outlet;

electrically energizable means for controlling the operating position of said valve means, said electrically energizable means including heater means mounted within said shell, said heater means comprising a first insulative surface, a second insulative surface and a resistive heater interposed between said first and said second surfaces, said heater means being flexible and folded to define receptacles for receiving a plurality of bimetallic discs interleaved between foids of said heater means;

sensing means mounted to at least one of said bimetallic discs for sensing the temperature of said electrically energizable means, the temperature of said electrically energizable means being dependent upon the temperature of said heater means, the temperature of the fluid passing between the inlet and outlet of the valve, and the ambient temperature of the valve; and

means for regulating power input to said electrically energizable means operatively connected to said sensing means, said regulating means adjusting the power input to said heater means to control the position of said valve means, said input power regulating means comprising a summing amplifier having a first input and a second input, said first input being electrically connected to a reference signal source, the second input being electrically connected to said sensing means, said summing amplifier having an output operatively connected to said electrically energizable means.

4,096,994

MANUAL DEODORIZER DISPENSER

John D. Bryson, Milwaukee, Wis., assignor to Will Ross, Inc., Milwaukee, Wis.

Filed Jan. 21, 1977, Ser. No. 761,544
Int. Cl.[2] A61L *9/04*
U.S. Cl. 239—57 **21 Claims**

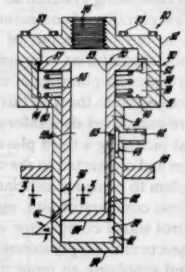
1. A dispenser comprising a housing having a first end wall having therein a first aperture, a second aperture spaced from said first end wall, a first valve member mounted on said housing for movement relative to said first aperture between a position closing said first aperture and a position opening said first aperture, a second valve member mounted on said housing for movement relative to said second aperture between a closed position closing said second aperture and an open position opening said second aperture, a plurality of spaced legs extending integrally from said first valve member in a direction extending away from said housing and adapted to support said housing in upright position on a supporting surface, to facilitate manual movement of said first valve member, and to afford flow of air between said legs and through said apertures and said housing when said valve members are in said open positions, and a container located in said housing and containing a substance which is to be dispensed in response to air flow through said housing.

4,096,995

VARIABLE SPRAY DIRECTION FUEL INJECTION NOZZLE

Edward D. Klomp, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 19, 1977, Ser. No. 788,989
Int. Cl.[2] F02M *47/00*
U.S. Cl. 239—94 **4 Claims**



1. A variable spray direction fuel injection nozzle includes a hollow nozzle body having a bored cylindrical portion at one end thereof closed by an end wall of said nozzle body, said nozzle body having an inlet for pressurized fuel at its opposite end, a hollow plunger valve, closed at one end and open at its other end, reciprocably positioned in said bored cylinder for predetermined axial movement relative thereto with its open end positioned to receive pressurized fuel from said inlet and

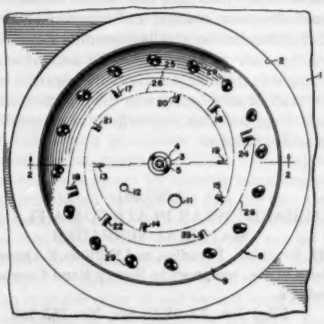
having its closed end forming with the closed end of said bored cylinder a low pressure fuel chamber, a radial port orifice in said nozzle body in communication with said bored cylinder a predetermined axial distance from said end wall, a radial slot extending through the peripheral wall of said valve and located a predetermined axial distance from its closed end whereby, during axial movement of said valve in said bored cylinder between a first position and a second position, said radial slot will be out of registry with said radial port orifice when said valve is in said first position and said radial slot will traverse said radial port orifice when said valve is in said second position, said nozzle body including first guide means and said valve including second guide means operatively associated with said first guide means to position said radial slot in axial alignment with said radial port orifice, spring means operatively associated with said nozzle body and with said valve to normally bias said valve in an axial direction to said first position so that said radial slot is out of registry with said radial port orifice and, fuel bleed passage means, including at least a fuel port in said nozzle body, in communication at one end with said low pressure fuel chamber and at its opposite end being operatively connectable to a low pressure fuel accumulator.

4,096,996

DIFFUSER FOR FUEL BURNERS

Elmer Ketchum, Jr., 4805 Lansing Ave., Jackson, Mich. 49201

Filed Sep. 13, 1976, Ser. No. 722,646
Int. Cl.[2] F23D *15/00*
U.S. Cl. 239—406 21 Claims



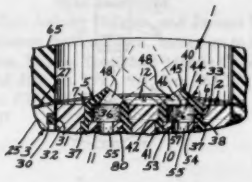
1. A diffuser construction for a fuel burner through which fuel is emitted in a conical stream, said construction comprising a generally conical wall forming a support having a central opening at its longitudinal axis through which said fuel stream may pass, said support diverging in the direction of flow of said fuel stream; and at least one series of a plurality of jets supported by and extending through said wall and through each of which a combustion-supporting gas may pass into said support, said jets spiraling about said support from its smaller diameter end toward its larger diameter end, each of said jets having a longitudinal axis extending along a line which substantially intersects the longitudinal axis of said support, and each of said jets having an inclination to said support such that the longitudinal axis of each of said jets forms with said wall an acute angle.

4,096,997

DUAL OUTLET CHECK VALVE ASSEMBLY

Richard E. Larson, Minnetonka, Minn., assignor to Cherne Industrial, Inc., Edina, Minn.

Continuation-in-part of Ser. No. 631,842, Nov. 13, 1975, abandoned. This application Aug. 27, 1976, Ser. No. 718,217
Int. Cl.[2] B05B *7/24*
U.S. Cl. 239—413 8 Claims



1. A check-valve assembly useful in dispensing the individual liquid substances of a two-substance chemical material without clogging the assembly, comprising:

a valve body;

nozzle means supported by said valve body for dispensing liquids under pressure, said nozzle means including at least two nozzle elements, each of said nozzle elements having a tubular bottom portion which adjoins a flexible generally closed dome-shaped upper portion, said dome-shaped upper portion having an exterior surface and an interior surface, said exterior surface having a conical shape tapering downwardly and outwardly from an apex spaced apart from said valve body, and containing a discharge aperture extending between said interior and said exterior surfaces and bounded by opposite sides, said discharge apertures being elongated slot-like apertures having one end positioned generally at said conical surface apex and extending radially therefrom toward said valve body, said nozzle element upper portions being deformable from a normally closed shape, in which the opposed sides of said discharge aperture generally abut one another, to an open shape in which the opposed sides of said discharge aperture are at least partially spaced apart from one another to form an opening therebetween in response to a positive pressure differential acting on said interior surface relative to said exterior surface, said nozzle element upper portion tending to be nondeformable in response to a positive pressure differential acting on said exterior surface relative to said interior surface, the bottom portion of each of said nozzle elements containing an inlet opening in communication with said discharge aperture; and

means for mounting said nozzle means in said valve body with said discharge apertures generally aligned, said discharge apertures being positioned facing one another to allow fan-like sprays of fluids which may be ejected from said outlet apertures to intersect, thereby facilitating mixing of such fluids.

4,096,998

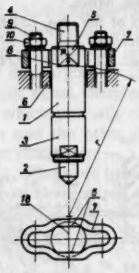
FUEL INJECTOR

Eugeniusz Siwak; Andrzej Krainski; Krzysztof Lendzion, and Jerzy Wewiór, all of Warsaw, Poland, assignors to Warszawskie Zaklady Mechaniczne PZL-WZM, Warsaw, Poland

Filed Apr. 30, 1976, Ser. No. 682,169
Int. Cl.[2] B05B *1/00;* F02M *61/14*
U.S. Cl. 239—533.3 13 Claims

1. A yoke for a fuel injector to be secured in an internal combustion engine, said yoke being an oval shaped ring of

uniform cross-section throughout its extent and including a waist portion adapted to embrace an injector and at least one



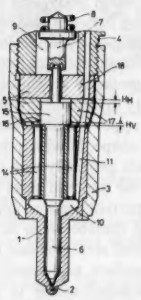
projecting portion extending away from the waist portion and constituted as a loop to engage a fixing bolt to secure said yoke.

4,096,999

FUEL INJECTION VALVE FOR PRELIMINARY AND PRINCIPAL INJECTION

Konrad Eckert, Stuttgart; Karl Hofmann, Neckarrems, and Kurt Seifert, Esslingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 29, 1976, Ser. No. 745,666
Claims priority, application Germany, Dec. 6, 1975, 2555019
Int. Cl.² B05B 1/30
U.S. Cl. 239—533.5 **5 Claims**



1. In a fuel injection valve for injecting a preliminary and main fuel quantity under pressure, including:

a nozzle body defining a valve seat, an injection aperture, at least part of a pressure chamber and at least part of a fuel line through which fuel is delivered to the pressure chamber, said aperture, pressure chamber and fuel line being in communication for the passage of fuel from the injection valve; a closing spring; and a needle valve in communication with the pressure chamber, and displaceable by the force of the closing spring against the fuel pressure into engagement with the valve seat the thereby terminate fuel flow from the injection aperture, the improvement comprising:

at least one piston means in communication with the pressure chamber, for joint displacement with the needle valve by the fuel pressure, in a direction opposite to the direction in which the needle valve displaced by the closing spring; and

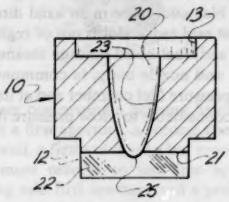
means defining a stop surface which is engageable with said at least one piston means, said stop surface defining means, being located in the path of the displacement of said at least one piston means by the fuel pressure such that the displacement of said at least one piston means by the fuel pressure is terminated prior to the termination of the displacement of the needle valve by the fuel pressure, said joint displacement of the needle valve and said at least one piston means, being associated with the injection of the preliminary fuel quantity, and said displacement of the needle valve after termination of the displacement of said at least one piston means being associated with the injection of the main fuel quantity.

4,097,000

SPRAY NOZZLE

Bernard A. Derr, 75 Granview Rd., Granville, Ohio 43023

Continuation-in-part of Ser. No. 593,198, Jul. 7, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,503
Int. Cl.² B05B 1/00
U.S. Cl. 239—599 **11 Claims**



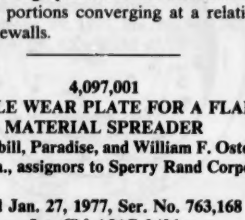
1. A spray nozzle for producing a wide-angle, fan shaped fluid discharge pattern having a body with a longitudinal flow axis, a discharge end portion with an outer end face, and elongated clearance channel formed in said discharge end portion in transversely oriented relationship to said flow axis opening at said outer end face, and a spray pattern control chamber formed in said body along said flow axis and having an inlet end axially spaced from said discharge end portion and an outlet end disposed interiorally of said body and intersecting with said clearance channel thereby defining an outlet orifice, said control chamber being an elongated cavity of generally oval cross-section with a long axis thereof oriented perpendicular to said clearance channel and transversely to said flow axis, said chamber having axially extending sidewalls and edge portions interconnecting said sidewalls and which both converge throughout their length relatively inwardly toward each respective wall or edge portion in the direction of said outlet orifice said edge portions converging at a relatively greater rate than said sidewalls.

4,097,001

DETACHABLE WEAR PLATE FOR A FLAIL-TYPE MATERIAL SPREADER

Warren H. Brackbill, Paradise, and William F. Ostergren, Terre Hill, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Jan. 27, 1977, Ser. No. 763,168
Int. Cl.² A01C 3/06
U.S. Cl. 239—658 **6 Claims**



6. In combination with a flail-type material spreader of the kind wherein a partially open topped tank has an arcuate-shaped wall with an upper elongated discharge edge, a mate-

rial discharge mechanism mounted within operable to propel material from within said tank over said discharge edge, said mechanism including rotatable shaft means and a plurality of flail members connnected thereto and extensible therefrom in response to the generation of centrifugal force by the rotation of said shaft means, said flail members travelling in a substantially circular path adjacent the inner circumference of said wall and said discharge edge, wherein the improvement comprises:

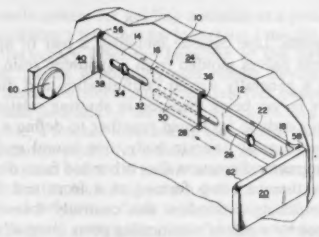
a detachable wear absorbing member having at least one portion disposed inwardly from said inner circumference of said wall such that upon rotation of said shaft means said flail members strike said wear absorbing member and not said wall thereby preventing damage to said wall in the event of wear elongation occurring in said flail members.

4,097,002

PAPER TOWEL HOLDER

John H. Krueger, 29600 Hillcrest Dr., Chisago City, Minn. 55013

Filed Jan. 28, 1977, Ser. No. 763,349
Int. Cl.[2] B65H *19/00*
U.S. Cl. 242—55.2 **4 Claims**



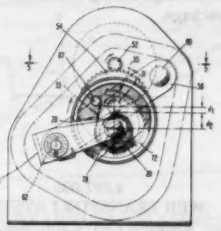
1. A device suited to hold and dispense paper toweling from a roll thereof comprising, a first bracket, a second bracket, said first bracket being telescopable into said second bracket between first and second predetermined limits, a strap means, said first and second brackets each having a free end respectively proximate each other and an end hingedly connected to said strap means, said first bracket comprising a first substantially planar web having an interior longitudinally elongated first slot located therein, means for slidably mounting said first bracket on a wall, said means for slidably mounting said first bracket being introduced through said first slot into a wall and having a first camming surface along which said first slot may cam between first and second positions, said second bracket comprising a channel member including a second substantially planar web, a pair of sidewalls, each sidewall depending normally from an opposite edge of said second web, each of said sidewalls terminating in a respectively inwardly turned lip flange, said second web of said second bracket having an interior longitudinally elongated second slot therein, means for slidably mounting said second bracket on said wall, said means for mounting said second bracket being introduced through said second slot into said wall and having a second camming surface along which said second slot may cam between another set of first and second positions, said free end of said first bracket having an interiorly extending longitudinal slot therein defining first and second runners in closely spaced relationship to each other, said first and second runners being telescopable into said second-bracket, said interiorly extending longitudinal slot having sufficient clearance so as to permit said first and second runners to by-pass said means for mounting said second bracket to said wall, means to hingably limit said strap means to a cantilevered position extending outwardly and normally from a plane passing through said first bracket and said second bracket, and journal means mounted on said strap means on which said roll of paper toweling may rotatably journal as said paper toweling is dispensed.

4,097,003

CONSTANT PULL SAFETY BELT RETRACTING MECHANISM

Richard C. Stouffer, Auburn Heights, and Jerome W. Schotthoefer, New Baltimore, both of Mich., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jan. 31, 1977, Ser. No. 763,779
Int. Cl.[2] A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107 **7 Claims**



1. In a vehicle safety system including a safety belt adapted to restrain an occupant in position on a seat, a safety belt constant pull retracting mechanism comprising:

a housing;

a spindle journalled on said housing and adapted to receive said safety belt in helical wrap, said spindle being rotatable in a winding direction and in an opposite, unwinding direction;

positive force coefficient characteristic biasing means for biasing said spindle to rotate in the winding direction; and

a spiral-shaped gear for coupling said biasing means to said spindle;

an end of said spindle including a first pinion having a constant radius, and means for coupling said spiral-shaped gear to said first pinion;

a decreasing gear ratio established between said spiral-shaped gear and said first pinion during protraction of said belt producing a negative coefficient of force characteristic to compensate for the positive characteristic of said biasing means, a resulting pull applied to the belt thereby being approximately constant as the belt is protracted from said housing; and

second biasing means biasing said spiral-shaped gear and said first pinion in enmeshment.

4,097,004

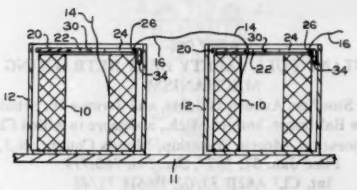
METHOD AND APPARATUS FOR UNWINDING ROVING PACKAGES FROM THE INSIDE

Walter J. Reese, North Huntington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 6, 1977, Ser. No. 794,592
Int. Cl.[2] B65H *49/36*
U.S. Cl. 242—129.72 **5 Claims**

1. Apparatus for unwinding strand material from the inside of a package of strand material comprising an axially movable guide means having an opening therein through which said strand material is unwound, a slot connected to said opening within which the outside end of the package is isolated from the balance of the package and one or more legs upon which said guide means may stand, said guide means being sufficient

in weight to restrain lifting of the package during unwinding of said package and said legs being sufficient in height to avoid



tangling of the package during the unwinding of the last portions of said package.

4,097,005

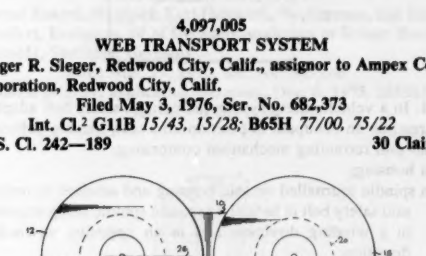
WEB TRANSPORT SYSTEM

Roger R. Sleger, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed May 3, 1976, Ser. No. 682,373

Int. Cl.[2] G11B *15/43, 15/28;* B65H *77/00, 75/22*

U.S. Cl. 242—189 **30 Claims**



1. A web transport system comprising:

a web storage system disposed to supply and take up web material that is movable bidirectionally along a web path;

a drive capstan positioned along the web path in non-slip engagement with the web material to control the motion of web material along the web path in accordance with motion of the capstan;

a capstan energization system coupled to control bidirectional motion of the capstan;

a pair of web tension arms positioned along the web path on opposite sides of the capstan to maintain buffer loops of web material on opposite sides of the capstan and to maintain web tension on opposite sides of the capstan in accordance with a torque applied to the respective tension arms;

a pair of torque transducers coupled to apply torque to the pair of tension arms respectively in response to tension command signal with said applied torque opposing the moments of web tension on said arms increasingly as said tension decreases and decreasingly as said tension increases; and

a torque control system coupled to generate tension command signals which vary in accordance with web transport system operating conditions.

4,097,006

MAGNETIC TAPE CASSETTE

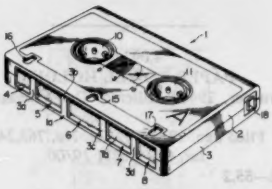
Shoichi Saito, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1976, Ser. No. 711,630

Claims priority, application Japan, Aug. 11, 1975, 50-110648[U]; Aug. 12, 1975, 50-111300[U]; Aug. 14, 1975, 50-112166[U]; Sep. 10, 1975, 50-124567[U]; Sep. 12, 1975, 50-126672[U]; Sep. 12, 1975, 50-126673[U]; Nov. 19, 1975, 50-157232[U]; Nov. 22, 1975, 50-159017[U]; Jan. 27, 1976, 51-007786[U]

Int. Cl.[2] G11B *23/10*

U.S. Cl. 242—199 **7 Claims**

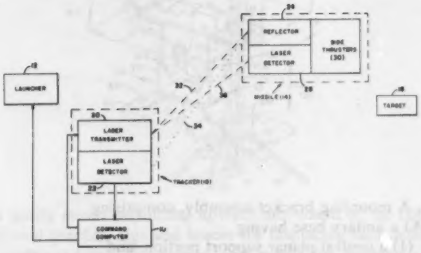


1. A magnetic tape cassette including a pair of upper and lower cassette halves molded from a synthetic resin material and having a generally similar configuration and dimension, said cassette halves being disposed in abutting relationship at their opening ends to be joined together to define a substantially flat rectangular cassette body, one lateral end face of which has a greater dimension than other end faces disposed at right angles thereto being formed as a front end face; the cassette comprising a window slot centrally formed in the front end face by a pair of partitioning posts integrally formed with the cassette half or halves for receiving a pinch roller, a pair of window slots symmetrically formed in front end face on the opposite sides of the first mentioned window slot by similar partitioning posts for receiving magnetic heads, an aperture formed adjacent to the front end face in alignment with the window slot associated with the pinch roller so as to extend vertically through the cassette halves, the aperture receiving a capstan, a spring abutment formed with one of the cassette halves immediately behind the capstan aperture, a pair of cassette positioning apertures formed toward the opposite ends of the front end face so as to vertically extend through the cassette halves, a pair of openings vertically extending through the cassette halves for receiving a pair of tape hubs, including a tape supply and a tape take-up hub rotatably disposed in the respective openings, a length of magnetic tape disposed on the tape supply hub and extending therefrom along the respective window slots while maintaining its magnetic surface in parallel relationship with the plane thereof to be taken up on the tape take-up hub, a plurality of tape guide pins and tape guide rollers located so as to cause the magnetic tape to extend along the respective window slots, one of said cassette halves including areas of a reduced wall thickness in its central portion which includes the tape hub openings and at positions rearwardly of at least some of said guide pins which are integrally molded with said one of said cassette halves, the areas of reduced wall thickness serving to maintain the pins in their upright position, a pair of liner sheets disposed on the opposing inner surfaces of the cassette halves for providing a smooth running of the magnetic tape, and a pad carrying leaf spring disposed between a portion of the tape length which extends along the window slots and the spring abutment and carrying a pair of tape pads which cause the tape to be urged against a magnetic head or heads which are advanced into the window slot or slots associated with the magnetic heads.

4,097,007
MISSILE GUIDANCE SYSTEM UTILIZING POLARIZATION

James J. Fagan; William F. Otto, and William B. McKnight, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 514,697, Oct. 15, 1974, Pat. No. 3,995,792. This application Sep. 13, 1976, Ser. No. 722,837
Int. Cl.[2] F42B *15/00*
U.S. Cl. 244—3.11 5 Claims

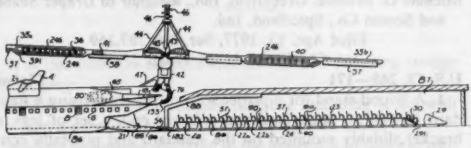


1. A missile system for guiding a missile to a predetermined target comprising a launcher for launching a missile in a predetermined trajectory from the launcher to the target and in which said missile is rotating, said missile having polarized reflector means thereon and detector receiver means interconnected to side thrusters on the missile for correcting the course of the missile; a tracker for tracking said missile and including radar transmitter means for transmitting electromagnetic rays to said polarized reflector means and said detector receiver means and further including return detector means for detecting polarized reflections from said polarized reflector means; and a command computer means interconnected to said launcher and said tracker for control thereof, said command computer means having a predetermined trajectory from the launcher to the target programmed therein, said command computer means receiving information from said tracker and said return detector means and comparing said received information with said predetermined trajectory to cause error signals to be transmitted as correction coded signals from said radar transmitter means to said detector receiver means to cause appropriate ones of said side thrusters to be actuated and cause the missile to be directed into a new trajectory relative to the target.

4,097,008
CARGO HANDLING SYSTEM FOR AIRCRAFT

David R. Pender, 1018 Marion St., Columbia, S.C. 29201

Division of Ser. No. 735,130, Oct. 21, 1976. This application May 23, 1977, Ser. No. 799,172
Int. Cl.[2] B64D *11/06*
U.S. Cl. 244—118 R 3 Claims

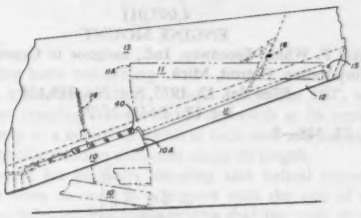


2. In a passenger and cargo handling system for an aircraft, an aircraft fuselage having a rear end ramp door hinged to the bottom of the fuselage to swing downwardly to an open position and upwardly to a closed inclined position, tracks on the bottom of the fuselage longitudinally thereof, a roll-in-roll-out cable train of cars guidably engaging said tracks, said cars each including a portion which constitutes a floor section of the aircraft and passenger seats above the floor sections and baggage compartments beneath the floor sections, and at least the rear endmost car of said cable train being tapered in a vertical plane rearwardly to fit snugly in the rear of the fuselage above said rear end ramp door when the latter is in said closed inclined position.

4,097,009
AIRCRAFT RAMP DOOR

Franklin K. Barnes, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 27, 1977, Ser. No. 791,228
Int. Cl.[2] B64C *1/14*
U.S. Cl. 244—129.5 14 Claims

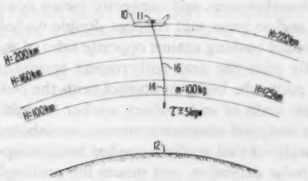


1. In an aircraft having a fuselage with a cargo door opening therein, a ramp door to seal at least part of said opening including the combination of hinge means to pivotally connect said ramp door to the fuselage of the aircraft, stationary ramp support means carried by the fuselage at spaced-apart locations along each of opposite sides of said cargo door opening, stationary carrier members on said ramp door at spaced-apart locations along each of opposite sides thereof for interlocking engagement with said support means, and actuator means coupled with said hinge means to linearly translate the entire said ramp door including said stationary carrier members from a forward-door sealing position wherein said carrier members are interlocked with said ramp support means and into an unlocked aft position of said ramp door wherein said carrier members are slidingly disengaged from said ramp support means.

4,097,010
SATELLITE CONNECTED BY MEANS OF A LONG TETHER TO A POWERED SPACECRAFT

Giuseppe Colombo, Padova, Italy, and Mario D. Grossi, Cambridge, Mass., assignors to Smithsonian Institution, Washington, D.C.

Filed Oct. 8, 1975, Ser. No. 620,679
Int. Cl.[2] B64G *1/20*
U.S. Cl. 244—158 18 Claims

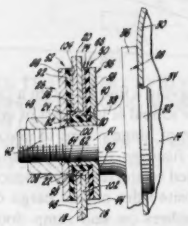


1. A system for conducting space experiments comprising a powered spacecraft, said spacecraft having thruster means capable of maintaining said spacecraft in a desired orbit, a satellite disposed in a suborbital mode and a flexible tether coupling said spacecraft and said satellite.

11. A method of conducting scientific investigations in space comprising the steps of:

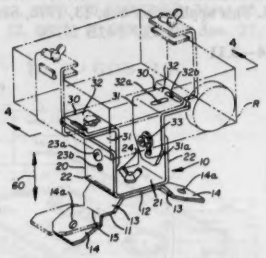
(a) launching a satellite to an orbital altitude by carriage with a powered spacecraft,
(b) deploying said satellite from said powered spacecraft to a suborbital altitude by release of a tether, and
(c) maintaining said satellite and spacecraft in a uniform orientation once deployed.

4,097,011
ENGINE MOUNT
Robert F. White, Speedway, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 13, 1977, Ser. No. 815,108
Int. Cl.[2] B64D *27/26*
U.S. Cl. 248—5 **2 Claims**



1. A noise isolation mount assembly for association with an engine and an opposite sided engine support strut for isolating structure borne transmission of high frequency gas turbine engine vibrations from the engine through the strut and into a passenger compartment comprising: a trunnion fixedly connected to the gas turbine engine, said trunnion having a locater shoulder and an outboard stud with a fastener end, a double-walled resilient bushing seated on said locater shoulder and including a first layer of elastomeric material bonded within the double-walled bushing to isolate noise vibration therebetween, said double-walled bushing including an integral, inner pilot tube close fit on said stud and further including an outboard bushing with an integral outer tubular extension arranged concentrically of said inner pilot tube and close fit within an engine strut, a double-walled resilient washer having a bore therethrough fit on said stud, said double-walled resilient washer including a second layer of elastomeric material bonded within the double-walled washer for allowing movement therebetween and to isolate high frequency noise transmission therebetween, and connector means connected to said fastener end to press said resilient double-walled washer and said outboard bushing against opposite sides of the engine strut to radially pilot the strut with respect to said trunnion, said inboard pilot tube being in contact with the outboard one of the double walls of said resilient washer to rigidly couple the trunnion and said connector means, an inboard one of the double walls of said resilient washer being supported on said outer tubular extension, and means for resiliently supporting said outer tubular extension on said trunnion to cause engine loads radially of said trunnion to be transferred into said inboard one of the double walls of said resilient washer and into said outboard bushing to cause said first and second layers of elastomeric material to be placed in shear to support the aforesaid engine loads and to maintain a vibration isolation break between said trunnion and the strut thereby to reduce structure borne transmission of noise between the engine and the strut.

4,097,012
MOUNTING BRACKET ASSEMBLY
Vernon E. McIntyre, Akron, Ohio, assignor to Wadsworth Equipment Company, Akron, Ohio
Filed Aug. 5, 1976, Ser. No. 711,855
Int. Cl.[2] B60R *7/00*
U.S. Cl. 248—23 **2 Claims**



1. A mounting bracket assembly, comprising:
(A) a unitary base having
(1) a central planar support portion, and
(2) integral opposed leg portions projecting therefrom;
(B) a first, generally U-shaped support member having its base adjustably secured to said planar support portion of said unitary base for movement about an axis normal to the plane thereof and its opposed legs projecting normally to said plane;
(C) a pair of opposed, generally L-shaped second support members, each being
(1) releasably secured to one leg of said first support member for movement
(a) about an axis normal to the plane of the legs of said support member, and
(b) in a plane lying parallel to the plane of the legs of said support member;
(D) the legs of said first support member each have a plurality of vertically aligned through apertures lying along the longitudinal axis thereof;
(E) said second support members having first and second legs;
(F) said first legs of each of said second support members having an elongate slot therein lying along the longitudinal axis of said leg for registry with said apertures of said first support members; and
(G) said opposed leg portions of said unitary base each being divided into first and second sections by a locally weakened area of reduced cross-section and said second sections defining the terminus sections and being deformable relatively of said first sections.

4,097,013
TRIPOD STAND FOR PROJECTION SCREEN
Michael D. Broome, Greenfield, Ind., assignor to Draper Shade and Screen Co., Spiceland, Ind.
Filed Apr. 13, 1977, Ser. No. 787,169
Int. Cl.[2] F16M *11/38;* **G03B** *21/56*
U.S. Cl. 248—171 **2 Claims**

1. A tripod stand for a projection screen comprising a standard having an upper end and a lower end, a set of legs, a bracket slidably mounted on the standard and pivotally connecting upper ends of said legs to the standard adjacent said lower end thereof for swinging movement between extended open and operative positions for supporting the stand and folded positions substantially parallel to one another, means latching the legs in the folded position thereof including an annular keeper secured around the standard and extending below the lower end thereof, detent elements secured to the legs and engaging in an open lower end of the keeper, a collar slidably mounted on the standard below said bracket, leg

braces having corresponding ends pivotally connected to said collar and opposite ends pivotally connected to said legs for bracing the legs in their extended positions, spring means supported by the standard and urging said collar downwardly,

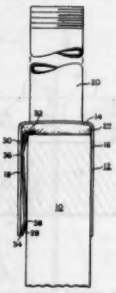
said spring means permitting upward movement of the collar with said bracket, legs and braces for displacing said detents upwardly and into the keeper, and means for latching said bracket to the standard to retain the legs in folded, latched positions.

4,097,014

COMBINATION SUPPORT BRACKET AND SELF-ADJUSTING WEDGE

Bruce K. Boundy, Holland, Mich., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 17, 1977, Ser. No. 797,889
Int. Cl.[2] A47F 5/00
U.S. Cl. 248—225.4 **7 Claims**



1. A combination support bracket and self-adjusting wedge comprising:

an inverted U-shaped saddle member including a top wall and a pair of downwardly extending side walls;

resilient pad means mounted to the underside of said top wall between said side walls; and

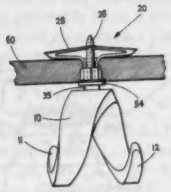
self-adjusting wedge means including a central planar portion and a pair of mounting tabs, said mounting tabs mounted to said resilient pad means adjacent one of said side walls, and said wedge means being movable to vary the distance between said wedge means and the other of said side walls whereby said saddle member can accommodate panels of varying thicknesses.

4,097,015

CEILING HOOK

Daniel Frishman, Andover, Mass.

Filed Sep. 7, 1976, Ser. No. 721,158
Int. Cl.[2] B42F 13/00
U.S. Cl. 248—339 **2 Claims**



1. A ceiling hook comprising

a helical segment spiralling through more than 360°, said segment tapering from a maximum width at its center, uniformly to a minimum width at each end, and having a substantially uniform thickness along its length;

and a means for pivotally securing said helical segment remote from its ends to a support with the axis of the segment substantially horizontal so that the ends of the helical segment are disposed to retain an object hung from them, said means for pivotally securing located at said center so that the ends of said segment form two hooks extending symmetrically on either side of said means for pivotally securing and said segment having a uniform thickness along its length;

said helical segment formed with a cylindrical hole passing through it substantially perpendicular to its helical axis at a point located midway between its ends, and wherein said means for securing comprises:

a hollow, cylindrical spacer, adapted to fit loosely within said hole, and having a base formed on one end perpendicular to its cylindrical axis,

an axle means comprising: a shaft fitting loosely within and extending along the axis of said cylindrical spacer; a head end adapted to rotatably support said helical segment and said cylindrical spacer, and a securing end adapted to attach to said support,

a washer having an outer diameter larger than the circumference of said hole, and fitting around said shaft and seating between said head of said axle means and the end of said cylindrical spacer opposite said base,

said cylindrical spacer having a length longer than the thickness of said helical segment so that when the securing ends of the axle means is attached to the support with said base pressed firmly against the support, the helical segment rotates freely on the cylindrical spacer.

4,097,016

ROTATABLE SEAT SUPPORT ASSEMBLY

Primo O. Petrucci, Livonia, Mich., assignor to Danbar, Inc., Warren, Mich.

Filed May 12, 1977, Ser. No. 796,427
Int. Cl.[2] F16M 13/00
U.S. Cl. 248—418 **11 Claims**

1. In a rotatable seat support assembly for supporting a seat for swiveling movement in opposite directions, the combination comprising:

(a) a seat pedestal means;

(b) a support tube fixedly mounted on said pedestal means;

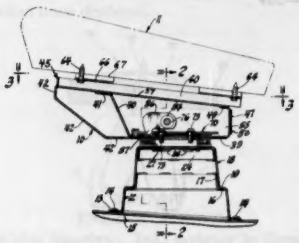
(c) a ring bearing means mounted around the support tube;

(d) a seat support means mounted around said support tube;

(e) means retaining said seat support means on said ring bearing means and on said support tube to prevent axial movement relative to said support tube and allow rotative movement about said support tube;

(f) means for releasably locking said seat support means in a normal use position;

(g) stop means for limiting a swiveling movement of the seat support means about the support tube; and,



(h) anti-noise means mounted between said support tube and means for retaining said seat support means on the bearing means.

4,097,017

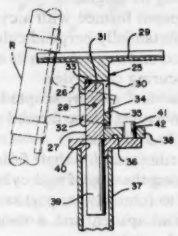
FISHING ROD HOLDING DEVICE

William H. Hazlitt, 112 "C" St., Pacheco, Calif. 94553

Continuation-in-part of Ser. No. 550,772, Feb. 18, 1975, abandoned. This application May 18, 1976, Ser. No. 687,521

Int. Cl.[2] A45B *25/28*

U.S. Cl. 248—515 **3 Claims**



1. A fishing rod holder comprising:

a. pivotal cradle member having an integral support element constructed to receive a fishing rod mounted thereto, and having an integral depending pivot element depending a relatively short length from the integral support element;

b. a pivot mounting member connected to said depending pivot element of said cradle member, said pivot element of said cradle member and said pivot mounting member having cooperating pivot means for providing free rotation of said cradle member on said mounting member in a vertical plane within predefined limits; said means including first stop means for limiting orientation said support element of said cradle member at a substantially horizontal position and second stop means for limiting orientation of said support element of said cradle member at a position approaching a vertical position, said cradle member being freely rotatable between said stop means; and

c. means for supporting said pivot mounting member to an ancillary means; wherein said cooperating pivot means includes a head portion having a receiving slot and a keyway; and, said depending pivot element has a depending tab with a distal end insertable in said receiving slot and has a pair of projecting wing tabs transverse to said depending tab, said wing tabs having ends short of the distal end of the depending tab, said ends engaging said keyway for pivot of said cradle member on said mounting member; and wherein said keyway has stop surfaces engageable with said wing tabs and limiting pivotal movement of said cradle member in said mounting member, said stop surfaces comprising said first and second stop means.

4,097,018

RIFLE PELLET CASTING MOLD

Charles R. O'Herien, Canastota, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 8, 1976, Ser. No. 739,697

Int. Cl.[2] B22C *9/06, 9/08*

U.S. Cl. 249—105 **6 Claims**

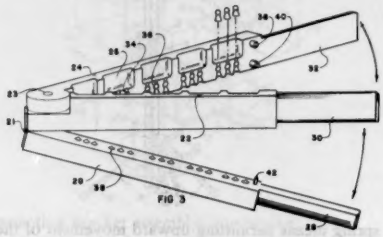


FIG 3

1. A rifle pellet casting mold, comprising:

a bottom section hingedly attached to a side section,

the side section pivotally attached to a second side section,

means for rigidly securing the sections together attached to the sections,

the assembled side sections forming a sprue through which a molten material may be poured,

a side section forming a gate connected to the sprue, &

the sections forming a mold connected to the gate, whereby a pellet may be cast.

4,097,019

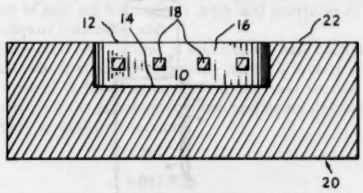
INGOT MOLD BASE MEMBER

Charles W. Connors, Wilmette, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Mar. 8, 1976, Ser. No. 664,725

Int. Cl.[2] B22D *7/12, 19/00*; C04B *35/10*

U.S. Cl. 249—204 **6 Claims**



1. A cast iron ingot mold base member, the top portion of which contains a preformed integral refractory insert of at least 4 inches in thickness united with the cast iron ingot mold base member during the casting of said base member, and where the thickness of the ingot mold base member exceeds the thickness of the refractory insert.

4,097,020

PLANT-WATERING DEVICE

Howard Sussman, c/o The Crackerbarrel, E. Shore Rd., Huntington, N.Y. 11743

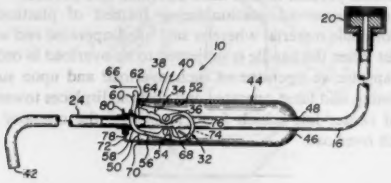
Filed May 5, 1977, Ser. No. 793,925

Int. Cl.[2] B05B *1/30*; F16K *7/06*

U.S. Cl. 251—10 **4 Claims**

1. An improved device for watering a plant or the like at a

location remote from a water source of the type including a flexible hose attached to convey water from said water source to the free end of said hose occupying an operative position in watering relation to said plant, said improvement comprising a clamp mounted adjacent said hose free end responsive to external pressure to partake of closing movement upon said hose for causing corresponding selected restricted flow of water exiting from said hose, and a tubular-shaped holding member disposed in covering relation over said clamp, said diameter of said tubular-shape thereof being of a selected extent to normally hold said clamp in a position closed upon said hose providing



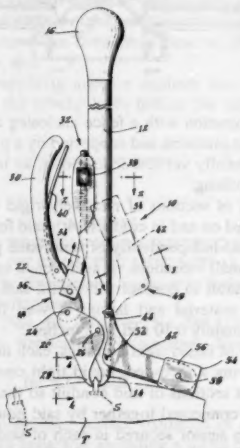
a desired restricted flow that obviates said exiting water from making splashing contact against said plant, and said construction material of said holding member being a pliable plastic sufficiently rigid to hold said clamp in said position to provide restricted flow and sufficiently pliable to enable an external pressure applied in an area of said holding member coextensive with said internal clamp to be transmitted to said clamp for effecting closing movement of said clamp, whereby said clamp normally provides a desired restricted flow in said exiting water and further responds to external pressure applied through said pliable cover to close upon said hose to provide complete shut-off of said water.

4,097,021

TIRE STUD PULLER

Walter J. Loboda, 1027 N. Lincoln, Park Ridge, Ill. 60068

Filed Jul. 29, 1977, Ser. No. 820,344
Int. Cl.[2] B66F *15/00*
U.S. Cl. 254—22 **6 Claims**



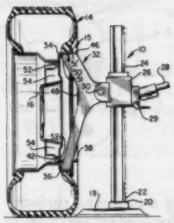
1. A tire stud puller comprising:
an elongated element terminating in a first jaw;
said first jaw substantially positioned along the longitudinal axis of said elongated element;
a pivotal element terminating in a second jaw, said pivotal element pivotably affixed to said elongated element with said second jaw operably disposed adjacent to said first saw;
means for urging said second jaw adjacent to said first jaw;
means for fixedly maintaining and locking said pivotal element in a position wherein said first and second jaws are clamped about a tire stud disposed therebetween; and
a leg pivotably affixed on one end thereof to said elongated element, said leg pivotable from a storage position adjacent to said elongated element to a use position extensive therefrom and adjacent to said first jaw.

4,097,022

WHEEL JACK APPARATUS

Robert E. Taylor, 309 SW. 11th St., Andrews, Tex. 79714

Filed Jul. 25, 1977, Ser. No. 818,825
Int. Cl.[2] B66F *13/00*
U.S. Cl. 254—133 R **9 Claims**



1. In combination with a vehicle supported by a plurality of wheels, each wheel having a circumferentially extending tire receiving rim spaced from a hub receiving bolt circle by a plurality of spokes, with the rim forming a circumferentially extending shoulder, a wheel jack for engaging and lifting the wheel along with a vehicle attached thereto;
said wheel jack includes a vertical column having a plurality of lift detents formed thereon, and a lifting mechanism which cooperates with said detents to cause the lifting mechanism to climb said column;
a wheel lift adaptor, means by which said adaptor is affixed to said lift mechanism; said adaptor having an upper end spaced forwardly and above and a lower end spaced forwardly and below the location where the adaptor is attached to the lift mechanism;
said upper end of said adaptor terminates in an edge portion which engages said shoulder; the marginal lower end of said adaptor has a fastener means formed thereon which extends through said spokes and engages wheel structure located in opposition to said shoulder.

4,097,023

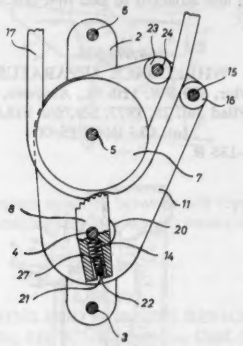
ROPE CLAMPING ARRANGEMENTS FOR SAILBOATS OR OTHER APPLICATIONS

Werner Muller, Aarau, Switzerland, assignor to Mubir AG fur Maschinen-und Apparatebau, Switzerland

Filed Sep. 8, 1976, Ser. No. 721,384
Claims priority, application Switzerland, Sep. 12, 1975, 12086/75; Dec. 16, 1975, 16321/75
Int. Cl.[2] B66D *5/16*
U.S. Cl. 254—156 **3 Claims**

1. Rope clamping arrangement, comprising:
a block;
a lever pivotally attached on said block at a first pivot mount and pivotable with respect to said block between a first and a second lever pivot position;
a cam pivotally attached on said block at a second pivot mount spaced from said first pivot mount, and pivotable with respect to said block between a third and fourth cam pivot position;
a pin on said lever and a slit in said cam in which said pin is

received, whereby said slit guides said pin and said pin is moved by said lever and, in turn, moves said cam; said pin and said slit being generally at one side of said second pivot mount and said first pivot mount being at the opposite side of said second pivot mount; said cam thereby being connected to said lever such that pivoting of said lever to its said first position pivots said cam to its said third position and pivoting of said lever to its said second position pivots said cam to its said fourth position;



said cam having a clamping surface;

biasing means for biasing said cam to said third position;

a rotatable roller supported to rotate on said block; said roller having a periphery which is located at a position between said first and said second pivot mounts; said cam clamping surface being so positioned that when said cam is pivoted to its said third position, its said clamping surface presses a rope against said roller periphery.

4,097,024

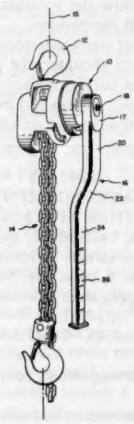
HAND HOIST/PULLER OPERATING HANDLE/LEVER

Kenneth D. Schreyer, Clarence, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Oct. 6, 1975, Ser. No. 619,595

Int. Cl.[2] B66D *1/00*

U.S. Cl. 254—169 **3 Claims**



1. A hoist/puller unit comprising in combination:

a load pull mechanism comprising a body having an anchoring means on one side thereof, a flexible tension member issuing from the other side of said body and adapted for connection to a load, and drive mechanism for applying tension to said tension member thereby defining a load system having a center line which extends longitudinally of said tension elements and passes through said body to said anchoring means, said drive mechanism being rotatable in said body about an axis which extends generally perpendicular to said center line;

a handle for operating said drive mechanism, said handle including a first portion connected to said drive mechanism in offset, spaced relation to said center line, a hand-operated end portion extending substantially parallel to said center line and spaced more closely thereto than is said first portion, and a reverse-curved portion joining said first portion to said hand-operated end portion;

said reverse-curved portion being formed of plastically deformable material whereby said hand-operated end will twist when the handle is subjected to an overload in order to apprise an operator of such overload and upon such twisting said hand-operated end portion displaces towards said center line which further apprises the operator of such overload.

4,097,025

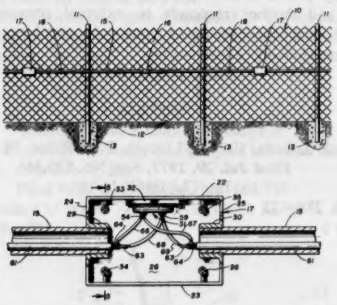
ELECTRONIC FENCE SURVEILLANCE APPARATUS

Charles R. Dettmann, Independence, and John J. Frederick, Excelsior, both of Minn., assignors to Electronic Surveillance Fence Security, Inc., Wayzata, Minn.

Filed Jul. 19, 1976, Ser. No. 706,500

Int. Cl.[2] E04H *17/00*; G08B *21/00*

U.S. Cl. 256—1 **8 Claims**



1. In combination with a fence enclosing an area to be protected against intrusion and supported by a plurality of spaced, rigid, substantially vertical fence posts, an intrusion detection system comprising:

a plurality of sections of relatively rigid electrical conduit supported on and in contact with said fence serially therealong and independently of said fence posts so that relatively small vibrations of such fence causes vibration of said conduit in contact therewith, said conduit being of ferrous material and having a wall thickness between approximately 0.10 and 0.12 inches,

a plurality of liquid tight housings, each interposed between and having a threaded, liquid tight connection with two adjacent sections of said conduit so that said sections are serially connected together by said housings,

a vibration sensor secured in each of said housings and responsive to vibrations transmitted to the housing in which it is located, each of said vibration sensors being effective to produce a vibratory electrical signal upon said conduit being vibrated,

an indicating device, and

connecting means operatively connecting a group of said sensors to said indicating device.

4,097,026

APPARATUS FOR MIXING A BASIC LIQUID SUBSTANCE WITH OTHER MEDIA

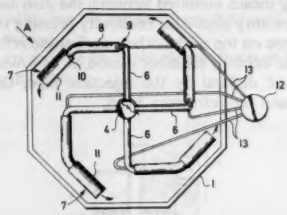
Karel Haindl, Prague, Czechoslovakia, assignor to Vyzkumny ustav vodohospodarsky, Prague, Czechoslovakia

Filed Jun. 6, 1975, Ser. No. 584,250

Claims priority, application Czechoslovakia, Jan. 24, 1975, 508-75

Int. Cl.[2] B01F *5/02*

U.S. Cl. 366—165 11 Claims



1. Apparatus for mixing a basic liquid with another medium, comprising in combination:

a. a container for the basic liquid having a bottom and peripheral walls,

b. a pressure source communicating with the interior of said container for producing a pressure stream of the basic liquid,

c. at least one supply pipe leading from the source of pressure,

d. at least one mixing means comprising:

e. a tubular body having an inlet end connected to said supply pipe and an outlet end communicating with the basic liquid within and near the bottom of the container,

f. baffle means within said tubular body in the vicinity of said inlet end of the tubular body, said baffle means occupying a substantial portion of the central part of the cross section of said tubular body, and providing a substantially annular gap between the internal surface of the tubular body and the periphery of the baffle means for directing a substantially annular flow of the basic liquid along at least a part of the internal surface of the tubular body, thereby leaving a hollow space within the annular flow in said part of the tubular body, and

g. means for supplying another medium into said hollow space within the tubular body behind the baffle means.

4,097,027

DEVICE AND PROCESS FOR LIMITING SURFACE OXIDATION OF GLOWING HOT METAL DROSS

Jean Michel, Marly, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Nov. 10, 1976, Ser. No. 740,421

Claims priority, application Switzerland, Nov. 21, 1975, 15102/75

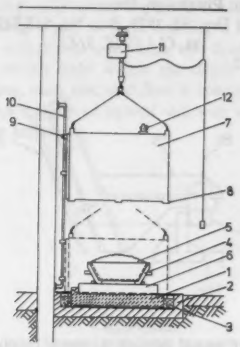
Int. Cl.[2] C22B *21/00*

U.S. Cl. 266—44 3 Claims

1. A process for limiting surface oxidation of glowing hot metallic dross in an apparatus including a metal bell having a space formed therein and an open bottom, a container for holding the dross, a base for the container to rest on, and a tank filled with liquid for receiving the base, the bell being formed with openings near the bottom thereof for providing communication channels for the liquid to pass therethrough, the steps comprising:

placing the shallow container onto said base,

lowering the metal bell over said dross, and,



sealing off the space formed within said bell from the outside atmosphere, whereby additional oxygen is prevented from being supplied to the surface of said dross.

4,097,028

METHOD OF MELTING AND APPARATUS THEREFOR

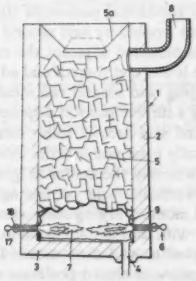
Hans-Jürgen Langhammer, Platjenwerbe, Germany, assignor to Klockner-Werke AG, Duisburg, Germany

Filed Jan. 22, 1976, Ser. No. 651,526

Claims priority, application Germany, Feb. 6, 1975, 2504946

Int. Cl.[2] C21B *7/16*

U.S. Cl. 266—47 5 Claims



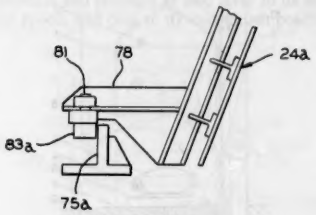
1. A melting method, comprising the steps of confining a charge of a material selected from the group consisting of scrap, sponge iron and pellets in a melting zone having a peripheral region; applying heat to a lower end of the charge to gradually melt the material thereof, including concurrently introducing a stream of a combustion-supporting substance and a layer of a combustible hydrocarbon substance which at least partly surrounds the stream into the melting zone to obtain a combustible mixture of the substances in the melting zone, and combusting the mixture in the melting zone outside the peripheral region thereof; and forming at least one protuberance of a solidified quantity of the molten material at the peripheral region of the melting zone to serve as a support for the charge, including passing the stream and the layer through the peripheral region of the melting zone for the layer to cool the peripheral region to an extent sufficient for the molten material present at the peripheral region of the melting zone to solidify and thereby form the protuberance.

4,097,029

ENCLOSURE FOR STEEL CONVERTING APPARATUS

Joseph Ziegler, Apollo, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1975, Ser. No. 645,529
Int. Cl.[2] C21C 5/42
U.S. Cl. 266—142 19 Claims



1. A converter vessel having a metal receiving opening formed adjacent an upper end,

an enclosure having an upper wall portion disposed above said vessel and side wall portions extending downwardly along the sides of said vessel,

an access opening formed in one of said wall portions, door means mounted adjacent said opening and externally of said enclosure, said door means having an inner surface facing said vessel and an outer surface,

mounting means disposed externally of said enclosure for movably supporting said door means and including first rail means adjacent the upper end of said door means and second rail means disposed adjacent the lower end of said door means,

first roller means mounted on said door means externally of said access opening for engaging said first rail means, said second rail means has one end adjacent one side of said opening and extends therefrom laterally away from said opening so that a substantial portion of the lower end of said opening is not fronted by said second rail means,

second roller means mounted adjacent the outer surface of said door and the lower end thereof and adjacent one side thereof for engaging said second rail means, said second rail means having a surface portion disposed between said access opening and said second roller means, said doors extending outwardly from said first rail means and relative to said opening whereby the center of gravity thereof is forwardly of a vertical plane containing said first rail means to create a moment urging said second roller means into engagement with said surface portion,

motive means coupled to said door means for moving the latter between open and closed positions relative to said access opening,

and exhaust means extending through the upper wall of said enclosure and being movable toward and away from the upper end of said vessel for collecting gases evolved from said vessel.

4,097,030

LANCE FOR DESULPHURIZING CAST IRON OR STEEL

René Desaar, Rue Michel Body, 67, 4330 Grace-Hollogne, Belgium

Filed Jan. 7, 1977, Ser. No. 757,533
Claims priority, application Belgium, Jan. 7, 1976, 45320; Dec. 17, 1976, 45792
Int. Cl.[2] C21C 5/32
U.S. Cl. 266—225 7 Claims

1. A desulphurizing lance for desulphurizing cast iron or steel comprising:

an injection pipe,

means for connecting the injection pipe with a source of desulphurizing agent and with a source of pressurized gas for carrying the desulphurizing agent through said injection pipe,

a refractory sleeve consisting of superposed refractory rings mounted about the injection pipe,

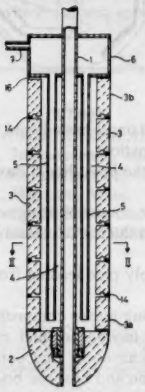
a refractory head enclosing the lower part of the injection pipe below the refractory sleeve,

a distributor case attached to the injection pipe at the end remote from the refractory head and hermetically enclosing said injection pipe about the refractory sleeve,

means for connecting the distributor case to a source of compressed air,

tightening means mounted between the distributor case and the refractory sleeve for resiliently pressing the refractory rings, one on top of the other, against the refractory head,

an annular cooling chamber closed at its lower and lateral parts and defined by the injection pipe, the refractory sleeve and the refractory head,



a plurality of inflow pipes connected to the distributor case at the bottom thereof and extending within the cooling chamber in a circumferential array parallel to the injection pipe as far as the lower part of the annular cooling chamber, said inflow pipes having open ends facing the closed lower part of said chamber, and

at least one discharge opening for the annular cooling chamber provided between the distributor case and the refractory sleeve at the top of said chamber such that cooling air flows after being introduced via the distributor case and the inflow pipes rapidly into the lower part of the annular cooling chamber to immediately cool the refractory head, upwardly about the inflow pipes and within the refractory sleeve, to cool the injection pipe and the refractory sleeve upon rising within the chamber with said heated air flow discharging through the cooling chamber discharge opening.

4,097,031

LANCE SUPPORTING AND GYRATING DEVICE IN A STEEL-REFINING CONVERTER

Kousaku Higuchi, Kakogawa; Satoshi Sato, Kobe, and Susumu Wada, Yokohama, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe and Nippon Kokan Kabushiki Kaisha, both of, Japan

Filed Sep. 21, 1977, Ser. No. 835,290
Claims priority, application Japan, Sep. 25, 1976, 51-114938; Sep. 25, 1976, 51-128805[U]; Sep. 25, 1976, 51-128806[U]; Sep. 25, 1976, 51-128807[U]; Sep. 25, 1976, 51-128808[U]
Int. Cl.[2] C21C 5/32
U.S. Cl. 266—226 12 Claims

1. In a steel-refining converter having a lance disposed therein, a device for supporting and gyrating the lance, said device comprising:

a lance carriage disposed above the converter and supported and adapted to be movable in guided vertical movement;

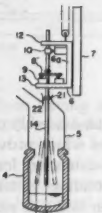
wobble bearing means attached to a part of the lance to support the lance in a manner permitting the lance to undergo gyratory motion relative thereto;

a lance receiving structure for supporting the wobble bearing means, supporting to undergo a revolutionary motion in a horizontal plane about a specific vertical axis;

means for supporting the lance receiving structure on the lance carriage in a manner permitting said revolutionary motion;

means for adjusting the radius of revolution of said revolutionary motion;

means for driving the lance receiving structure in said revolutionary motion;



a lance holding means mounted on the lance carriage at a position vertically apart from the wobble bearing means in the lance supporting state thereof and operated to hold the lance in vertically fixed position coincident with said specific vertical axis; and

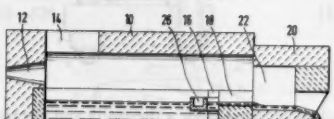
node bearing means for the lance provided at a position such as to fit into a stationary structure disposed below and spaced apart from the wobble bearing means when the lance is in operative position in the converter and functioning to hold the lance against horizontal movement thereof thereby to constitute a central node about which the lance undergoes a gyratory motion when the lance receiving structure is thus driven in said revolutionary motion.

4,097,032

FOREHEARTH WITH WEIR, PARTICULARLY FOR USE IN A BASALT SMELTING FURNACE

Wonter Mauritz, Bad Honnef, Germany, assignor to Schmelzbasaltwerk Kalenborn, Dr. Ing. Mauritz Kg, Kalenborn, Germany

Filed Mar. 3, 1977, Ser. No. 773,852
Int. Cl.[2] F27D *15/00*
U.S. Cl. 266—230 **11 Claims**



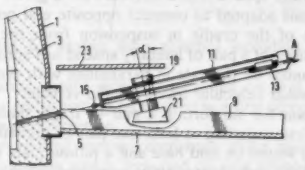
1. A foundry forehearth for collecting molten material to be cast, comprising a weir disposed at the discharge end of the forehearth, said weir having a channel transversing the top surface thereof, for discharging molten material into the discharge end of the forehearth, a free-floating float being many times smaller than the forehearth and having a U-shaped cross-section, said float bracing against said weir and defining a transit passage therebetween leading to said channel, said transit passage being uniformly shaped throughout its entire length, the cross-section thereof, transversally to its longitudinal axis, having an inverted trapezoid configuration, and said weir comprising a pair of jaws defining a centrally disposed recess in the wall of said weir facing said float, a portion of said float being loosely held within the depth of said centrally disposed recess, such that said float is continuously free-floating even when it is forced against said weir under the pressure of the molten material.

4,097,033

DRILLING MACHINE FOR BLAST FURNACE TAPHOLES

Pierre Mailliet, Howald, Luxembourg, assignor to S. A. des Anciens Etablissements Paul Worth, Luxembourg, Luxembourg

Filed Feb. 18, 1977, Ser. No. 770,191
Claims priority, application Luxembourg, Feb. 20, 1976, 74398
Int. Cl.[2] C21B *7/12*
U.S. Cl. 266—271 **23 Claims**



1. Apparatus for opening shaft furnace tapholes, the furnace having a vertical axis and an external longitudinally extending molten metal flow channel in registration with each taphole, the apparatus comprising:

support column means, said support column means having a longitudinal axis which is angularly inclined toward the furnace axis, said column means longitudinal axis also being angularly inclined with respect to a vertical plane through the taphole and the axis of the flow channel in registration with the taphole with which the apparatus cooperates;

arm means pivotally mounted on said support column means and extending outwardly therefrom, said arm means having an axis;

tool holder means, said tool holder means including an elongated tool support bar;

means for rigidly attaching said tool holder means support bar to a first end of said arm means, said attaching means permitting adjustment of said tool holder means support bar relative to said arm means;

fluid operated drill means mounted on said tool holder means support bar for movement along said bar;

means for delivering operating fluid to said drill means; and

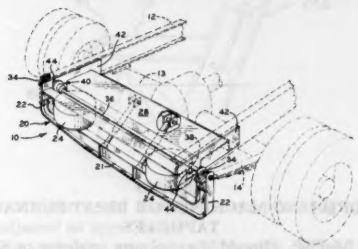
means for rotating said arm means about the axis of said column means to move said tool holder means between operating and retracted positions, said rotating means including a hydraulic actuator having a movable output member coupled to said arm means, said rotating means further including means for limiting the displacement of said actuator output member to an amount corresponding to the operating position of said tool holder means.

4,097,034

AIR-RIDE SUSPENSION SYSTEM

Philip J. Sweet; Buck C. Hamlet, and David L. Sweet, all of Fresno, Calif., assignors to American Carrier Equipment, Inc., Calif.

Filed Apr. 7, 1977, Ser. No. 785,344
Int. Cl.[2] B60G *11/46*
U.S. Cl. 267—15 A **9 Claims**



1. In a suspension system for a wheeled vehicle characterized by at least one pair of laterally spaced longitudinal frame members, a load bearing axle and a pair of laterally spaced leaf spring assemblies mounted on said axle in transverse relation therewith, the improvement comprising:

A. a load supporting cradle having an elongated base adapted to be extended transversely beneath a pair of laterally spaced frame members for a given vehicle;

B. means adapted to connect opposite end portions of the base of the cradle in suspension from the trailing end portions of a pair of laterally spaced leaf spring assemblies mounted on the axle in parallelism with the direction of intended vehicular travel for the vehicle;

C. means for supporting a pair of frame members for the vehicle including at least one pair of mutually spaced air bags seated on said base and a pillow plate seated on the air bags and adapted to be connected to the frame members; and

D. centering means for restraining said cradle from transverse motion relative to said pair of frame members including a link rigidly extended in substantial parallelism with said base and adapted to be connected with at least one leaf spring assembly of said pair of leaf spring assemblies and one frame member of said pair for restraining the pair of frame members from lateral motion relative to said leaf spring assemblies.

4,097,035

CLAMPING FRAME FOR PLASTIC FORMING APPARATUS

Jack N. Shuman, 3330 Foxcroft Rd., Charlotte, N.C. 28211

Filed May 31, 1977, Ser. No. 802,133
Int. Cl.[2] B25B *5/14*
U.S. Cl. 269—121 **7 Claims**

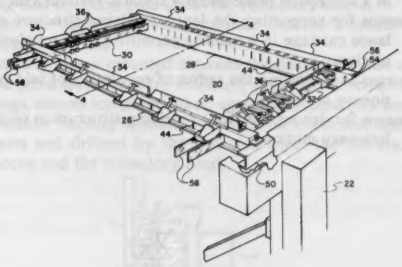
1. In apparatus for use in forming plastic material into predetermined configurations, the improvement comprising a clamping frame for engaging the peripheral edges of a sheet of plastic material during plasticising and forming of said plastic material, said clamping frame including:

(a) a pair of side elements having clamping means mounted along the length thereof for engaging said peripheral edges of said plastic material, said side elements being arranged in a spaced parallel relationship with each said side element having a plurality of facing apertures formed along the length thereof and extending therethrough;

(b) mounting means permitting said side elements to move toward and away from one another to a plurality of positions at which said side elements have a predetermined spacing therebetween;

(c) a pair of support means slidably mounted in said facing apertures of said side elements to extend therebetween at all said positions thereof; and

(d) a plurality of individual clamping sub-assembly means selectively mountable in side-by-side relationship on each said support means along the extending length thereof,



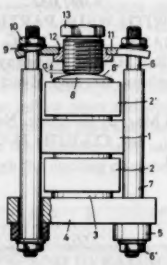
said clamping sub-assembly means having different predetermined lengths which provide, in selected combinations thereof, a total extending length along each said support means corresponding generally to said predetermined spacing between said side elements at each of said plurality of positions thereof.

4,097,036

CLAMPING DEVICE FOR A THERMALLY AND ELECTRICALLY PRESSURE-CONTACTED SEMICONDUCTOR COMPONENT IN DISK-CELL CONSTRUCTION

Arno Henke, Gorxheimertal, Germany, assignor to BBC Brown, Boveri & Company, Limited, Mannheim, Germany

Filed May 4, 1977, Ser. No. 793,775
Int. Cl.[2] B25B *5/14*
U.S. Cl. 269—254 R **6 Claims**



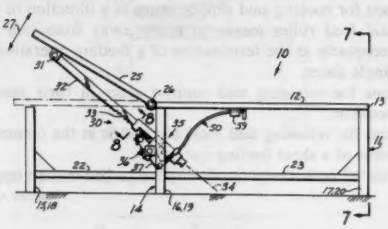
1. A clamping device for a thermally and electrically pressure-contacted semiconductor component in diskcell construction comprising two pressure or conductor plates in the form of liquid-cooled capsules between which the semiconductor component is disposed, the two liquid-cooled capsules being squeezed together by a clamping device comprising four clamping bolts passing through the corners of a large-area resilient clamping plate with a central threaded insert and a central clamping screw pressing on a convex surface of one of the two liquid-cooled capsules, the clamping screw being screwed over a certain rotation angle measurable on the clamping device, stressing the clamping plate and pressing on the convex surface with a force proportional to said angle.

4,097,037

TABLE WITH LEAF AND LOCKING SYSTEM

Victor H. Tardiff, San Jacinto, Calif., assignor to Tru-Eze Manufacturing Co., Inc., Temecula, Calif.

Filed Jul. 8, 1977, Ser. No. 813,844
Int. Cl.[2] A61G *13/00*
U.S. Cl. 269—323 9 Claims



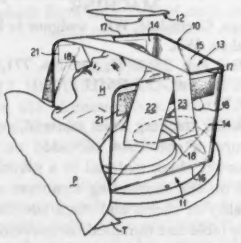
1. In combination: a platform having a horizontal surface and an upright support beneath said horizontal surface, said support having a dimension of height; a horizontal first hinge means on said platform; a rigid leaf pivotally mounted to said platform by said first hinge means to permit the leaf to hinge around said first hinge means; horizontal second hinge means on said leaf spaced from first hinge means; a lock shaft having an axis of motion, and being pivotally mounted to said second hinge means; third hinge means attached to the support at an elevation below said horizontal surface; and releasable lock means pivotally mounted to said third hinge means, said lock shaft being engaged to said lock means for axial movement therein, whereby a three link locking system is created for the leaf as follows: a first rigid link between the third and first hinge means, a second rigid link between the first and the second hinge means, and a third rigid link between the second and third hinge means, said lock means being so constructed and arranged as releasably to lock the shaft thereto and at any shaft position in the range of permissible positions, thereby to adjust the length of the third link and the angle of the leaf, said three link system being rigid when the lock means is locked, in which said lock shaft bears rack gear teeth, and in which said lock means comprises an idler gear with teeth meshed to the rack gear teeth, and a lock gear having teeth always meshed to the idler gear teeth and so disposed and arranged that they can also be meshed with the rack gear teeth to lock the gears together or removed therefrom to enable the rack gear teeth to move relative to the idler gear.

4,097,038

HEADREST

Alan A. Jansen, 4201 SW. 47th Dr., Portland, Oreg. 97221

Filed Sep. 30, 1977, Ser. No. 838,244
Int. Cl.[2] A61G *13/00*
U.S. Cl. 269—328 11 Claims



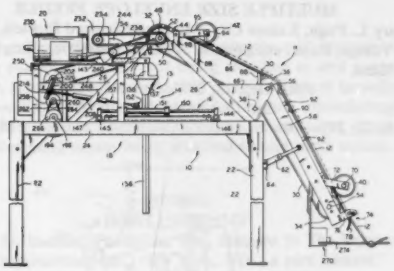
1. A headrest which comprises a U-shaped body with an open unobstructed front, top and bottom having upstanding side walls connected by an end wall sized to freely surround a human head, said side walls having bottom edges for resting on a supporting surface and smooth top edges, a flexible sling tape draped over said smooth top edges and suspended from said side walls for cradling a human head projecting through said open unobstructed front within the body in spaced relation from the side and end walls above the bottom of the body, annd cooperating fastener materials on the sling tape and outer faces of the side walls adhering when pressed together to adjustably anchor the sling to the side walls.

4,097,039

STRIP LAYING APPARATUS

Thomas A. Fischer, Fargo, N. Dak., assignor to Applied Power Inc., Menomonee Falls, Wis.

Filed Jul. 23, 1976, Ser. No. 708,065
Int. Cl.[2] B65H *45/20*
U.S. Cl. 270—79 37 Claims



1. Apparatus for laying strip material including support means,

first translating means movably mounted on said support means for reciprocating movement in a first direction and in an opposite direction,

said first translating means comprising slider means, first slider supporting means mounted on said support means for supporting said slider means for sliding movement in said first and opposite directions on said support means,

said first slider supporting means including elongate means extending in said first direction, said slider means includes tubular means slidably mounted and telescopingly received on said elongate means,

second translating means mounted on said first translating means for reciprocating movement in a second direction generally normal to said first direction,

said second translating means including second elongated slider support means extending in said second direction and tubular means slidably mounted on said second slider supporting means for reciprocating movement thereon,

elongate material distributing means universally pivotally mounted adjacent to an end on said support means and extending generally downwardly therefrom to define upper and lower ends, said material distributing means being constructed and arranged for receiving material at its upper end and discharging the same from its lower end,

said distributing means being coupled adjacent its lower end to said second translating means for movement therewith,

drive means coupled to each of said translating means for moving said first translating means in said first and said opposite direction and for reciprocating said second translating means in said second direction on said first translating means,

an elongate, upwardly inclined conveyor means having one end elevated and disposed adjacent the upper end of said material distributing means, said conveyor means being constructed and arranged for receiving an elongate strip of material,

said conveying means including elongate means movable generally upwardly toward the upper end of said distrib-

uting means, said conveying means including pressure means for biasing a strip of material against said elongate means whereby the latter moves said material upwardly to said distributing means and guide means disposed above the upper end of said conveying means for redirecting said strip material downwardly to the upper end of said distributing means,

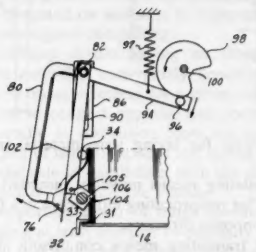
said drive means including first crank means mounted for rotation about an axis generally parallel to said first direction and linkage means connecting said crank means to said second translating means for moving the second translating means in said second direction, and means for adjusting the distance from said axis that said crank means is engaged by said linkage means so that adjustment thereof will change the magnitude of reciprocation of said second translating means.

4,097,040

MULTIPLE SIZE ENVELOPE FEEDER

Gary L. Pugh, Kansas City, Mo., and Glenford Rowlett, Prairie Village, Kans., assignors to Stephens Industries, Inc., Lenexa, Kans.

Filed Oct. 28, 1976, Ser. No. 736,448
Int. Cl.[2] B65H *3/08, 3/56*
U.S. Cl. 271—104 **19 Claims**



1. Apparatus for supplying envelopes one at a time from a stack of envelopes arranged on edge including, in combination: first and second spaced retainer members for retaining one end of said stack; an arm having a suction device mounted at one and thereof; a pivot shaft supporting the arm at the other end for pivotal movement thereof; means for providing a slot slidably receiving said pivot shaft; and means for sequentially moving said pivot shaft along said slot in one direction to move the suction device adjacent to said one end of said stack, rotating said shaft in such a direction as to move said suction device into engagement with said one end of said stack to grip the leading envelope, rotating said shaft in the opposite direction to separate said leading envelope from said first retainer member, and then moving said pivot shaft along said pivot shaft slot in the opposite direction to separate said leading envelope from said second retainer member, said moving means including a drive shaft having an eccentric mounted thereon, means coupling the eccentric to the pivot shaft, a cam shaft having a cam mounted thereon, a follower arm having one end fixedly attached to said pivot shaft, and means urging the follower arm against the cam.

4,097,041

SHEET FEEDING APPARATUS

Sakae Fujimoto, Chofu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 2, 1976, Ser. No. 738,222
Claims priority, application Japan, Nov. 6, 1975, 50-133206
Int. Cl.[2] B65H *3/06, 3/56*
U.S. Cl. 271—114 **9 Claims**

1. A sheet feeding apparatus for feeding sheets from a stack disposed on a sheet receptacle, said apparatus comprising:

a pair of pivotable support arms having their free ends rockable toward and away from said sheet receptacle;

a feed roller support shaft rotatably mounted on the free ends of said support arms;

feed roller means on said support shaft for engaging and feeding a sheet from said sheet receptacle;

drive means for rotating said feed roller means;

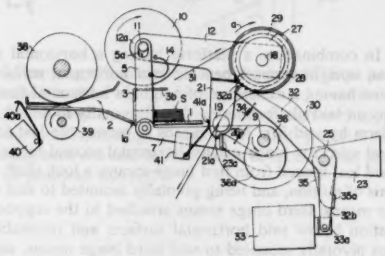
means for controlling the operation of said drive means;

means for rocking said support arms in a direction to cause said feed roller means to move away from said sheet receptacle at the termination of a feeding operation of a single sheet;

means for retaining said support arms in their removed position;

means for releasing said retaining means at the commencement of a sheet feeding operation;

a pair of corner separators disposed adjacent the opposite



corners of the front end of said sheet receptacle for bearing against the opposite corners of the leading end of a sheet during a sheet feeding operation; and

means for mounting said corner separators on said support arms for movement at least partly in following relationship with the rocking motion of said support arms whereby said corner separators bear against the opposite corners of the leading end of a sheet only during a sheet feeding operation, said mounting means comprising:

a pair of support links having the corner separators mounted thereon and respectively connected to the free ends of the respective support arms by freely pivoting at one end on the opposite ends of said feed roller support shaft; and

a pair of additional pivotable arms each having one of its ends loosely fitted on said rocking means and its other end respectively pivoted to the other ends of said support links.

4,097,042

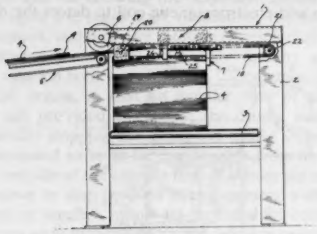
BACKSTOP CONSTRUCTION FOR A STACKING MACHINE

Vincent E. Rozga, Greendale, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed Feb. 25, 1977, Ser. No. 771,976
Int. Cl.[2] B65H *31/20*
U.S. Cl. 271—171 **11 Claims**

1. A machine for stacking sheet material, comprising a supporting structure, a conveyor mounted on the supporting structure to convey sheet material in a given direction, a lift table mounted on the supporting structure and disposed to receive a plurality of sheets and stack the sheets, a truck located above the table and mounted for movement with respect to said table in said direction, a carriage mounted for linear movement on the truck in said direction, said carriage being movable between a first position adjacent the upstream end of the truck to a second position adjacent the downstream end of

the truck, latching means to lock the carriage in the first position, and a backstop carried by the carriage and disposed to be



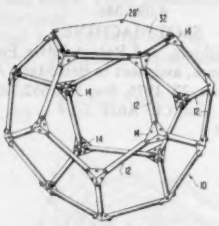
engaged by the leading ends of the sheets as they are stacked on the table.

4,097,043

PLAYGROUND CLIMBER

Richard Rudy, Reedsville, Pa., assignor to Kilgore Corporation, Toone, Tenn.

Filed Feb. 20, 1976, Ser. No. 659,686
Int. Cl.[2] A63B *9/00*
U.S. Cl. 272—113 **5 Claims**



1. A playground climber, comprising a plurality of modular units connected to one another, each said modular unit being a regular dodecahedron formed of interconnecting dodecahedron structural member means having generally cylindrical climbing interconnecting struts on the face of the dodecahedron so closely spaced a child could stand on one strut and grasp any of the other struts of the face on which the child is climbing, each face of each dodecahedron unit comprising a regular pentagon and a majority of said faces being open to permit a child to pass therethrough climbing thereon and grasping of said climbing struts by a child, each said pentagon comprising five climbing struts with two said adjacent struts meeting at an angle of 108°, each said dodecahedron unit having twenty corners, and each said corner being formed by the juncture of three of said climbing struts whereby a child can climb said playground climber by grasping and placing his feet on said struts which form each face of each unit.

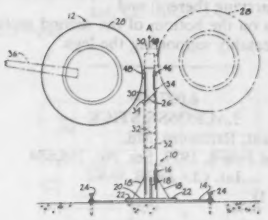
4,097,044

BASEBALL BATTING TRAINING APPARATUS

Jack K. Miniere, 685 Minnesota Ave., Winter Park, Fla. 32789

Filed Nov. 26, 1976, Ser. No. 745,062
Int. Cl.[2] A63B *69/40*
U.S. Cl. 273—26 R **7 Claims**

1. A batting training device comprising: support means for operatively positioning said device above a support surface; target means rotably disposed on said support means and positioned to receive the impact of a bat swung into contact therewith, said support means including cam means formed thereon to guide the movement of said target means whereby said target means will assume a substantially identical stationary position after each impact of said target means by said bat, and wherein said target means comprises a contact element disposed to receive the impact of said bat and pivot means fixedly attached to said contact element, said pivot means including guide means formed thereon in engaging relation to said cam means; and attachment means disposed in fixed, interconnecting relation between said contact element and said pivot means



and comprising plate means for supporting said contact element to said pivot means and being attached to said contact element, said plate means and said contact element including correspondingly positioned apertures formed therethrough, and fastening means extending through said apertures, one end of said fastening means being attached to said pivot means.

4,097,045

BOWLING RAMP

Russell D. Bechtel, Pensacola, Fla., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 28, 1977, Ser. No. 792,008
Int. Cl.[2] A63D *5/00*
U.S. Cl. 273—54 R **1 Claim**

1. A bowling ramp for the acceleration of a bowling ball by a handicapped, disabled, infirm, and the like, person, said bowling ramp comprising

a portable ramp for a bowling ball, said ramp being bent at approximately 135° to form a first substantially linear section of predetermined length and a second substantially linear section having a length approximately three times the predetermined length, said second section extending substantially angularly from said first section and curving slightly at its end farthest from said first section, said ramp having a top with a central channel extending along its length for directing a bowling ball and a bottom;

a pair of spaced socket members at the bottom of the first section intermediate its end joining the second section and its end farthest from said second section;

a pair of legs removably accommodated in the socket members for supporting the ramp with the first section substantially horizontal at a predetermined height above a supporting surface and the second section extending from said predetermined height to said supporting surface at approximately 45° and curving slightly upward in its area abutting said supporting surface, said legs being symmetrical about a vertical line through the center of the first

section and angularly disposed relative to said line since they diverge from said line as their distance from said first section increases;

a rubber strip on the bottom of the ramp at the free end of the second section for abutting the supporting surface and preventing slippage thereon and scuffing thereof;

a handle in the channel of the second section of the ramp for facilitating carrying thereof; and

resilient clamps on the bottom of the second section of the ramp for releasably supporting the legs.

4,097,046

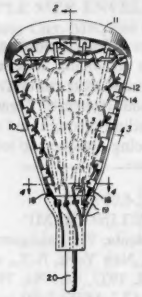
LACROSSE STICK

Elias Stewart Friant, Baltimore, Md.

Filed Feb. 8, 1977, Ser. No. 766,654

Int. Cl.[2] A63B *59/02*

U.S. Cl. 273—96 D **8 Claims**



1. A lacrosse stick head, of the type including a frame and a net forming a ball pocket secured to said frame at spaced points there along, said frame being formed of a length of flat strip material bent to provide at least one elongated side element and an end portion twisted with respect to said side element to form the conventional scoop-shaped end of the frame; the novelty including that said strip of material has a narrow slot extending along the edge of said strip forming the back of said frame and the inner edge of said scoop-shaped end, said slot being narrow at the edge of said frame and having a larger section interiorly of said strip than at its edge, an elongated flexable element carrying means fixed at spaced points thereabout to which said net is secured, said elongated flexible element with said means fixed thereto being slideable along said slot with said means extending outwardly through said slot at the edge of said frame, said flexible element being of a diameter greater than said slot at the edge of said frame whereby said means spaced along said frame by said flexible element forms a strong securement for said net on said frame and accurately spaces said means along said frame.

4,097,047

DEVICE FOR KICKING BALL IN A PINBALL GAME MACHINE

Shikanosuke Ochi, Hon, Japan, assignor to Kabushiki Kaisha Sega Enterprises, Tokyo, Japan

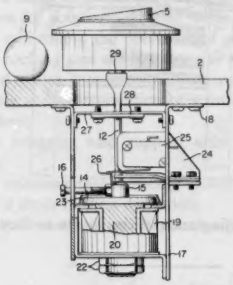
Filed Dec. 20, 1976, Ser. No. 752,662

Claims priority, application Japan, Dec. 24, 1975, 50-173651[U]

Int. Cl.[2] A63F *7/00*

U.S. Cl. 273—127 R **8 Claims**

1. A device for kicking a ball in a pinball game machine having a playing surface on which the ball is adapted to be rollingly moved and bumper heads adapted to repel the ball when the same abuts thereagainst, wherein the improvement comprises a frame detachably mounted on the lower surface of said playing surface in position beneath each said bumper head, an electromagnetic coil secured to said frame and spaced below said playing surface, an armature disc movably held on said electromagnetic coil between said electromagnetic coil and said playing surface, pole means rigidly connecting said armature disc to the respective bumper head and a switch connected to said electromagnetic coil to detect the tilting of



said bumper head upon abutment thereof by said ball so as to be closed for energizing said electromagnetic coil which causes said armature disc to be attracted to said electromagnetic coil and rapidly return said bumper head to a normal position to repel said ball.

4,097,048

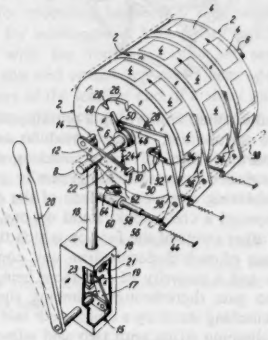
SLOT MACHINE

Freddy Poulsen, Höjbjerg, and Robert Edvin Poulsen, Hinnerup, both of Denmark, assignors to Bell-Matic A/S, Denmark

Filed Jan. 27, 1976, Ser. No. 652,785

Int. Cl.[2] A63F *5/04*

U.S. Cl. 273—143 R **9 Claims**



1. A slot machine which includes a common shaft, a plurality of rotary drums individually rotatable about said common shaft, an annular row of various signs and symbols provided on each of said drums, a starting mechanism for providing a start rotation of said common shaft, an actuator handle operatively connected with said starting mechanism, means for starting a rotation of the drums in response to an actuation of said starting mechanism by said actuator handle, and means for automatically stopping the respective drums at mutually different periods of time after a start of rotation of the drums, characterized in that said starting mechanism includes means for causing said common shaft to be rotated initially in a first direction of rotation in response to the actuator handle being pulled toward a start position and for imparting to said common shaft a rapid start rotation in a second direction of rotation opposite to the first direction in response to the actuator handle reaching the start position, means are provided for mounting the drums on said common shaft so as to permit the common shaft to be rotatable relative to the drums through at least a fraction of one

revolution including a one-way rotation clutch arranged between the common shaft and each respective drum for causing the drums to be rotated by the rapid start rotation of the common shaft and for allowing the respective drums to continue rotation upon the rapid start rotation of the common shaft being stopped, said one-way rotation clutch including a release for rendering the clutch inoperative thereby allowing the relative rotation both ways between the common shaft and the associated drums, in that an annular row of abutments or notches are provided at each of the drums, said means for automatically stopping the respective drums including a pawl means mounted so as to be displaceable from an inoperative position outside of the annular row of abutments or notches to an operative or stop position in engagement with one of the abutments or notches, means are provided for controlling said pawl means so as to maintain a pawl means in engagement with an abutment or notch during the initial rotation of said common shaft in said first direction and to the inoperative position immediately before the rapid start rotation of the common shaft, and in that holding means are associated with the respective drums for enabling a player selected individual arresting of any one of the drums while the remaining drums are rotated, said holding means including means for actuating said release means of the one-way rotation clutch.

4,097,049
SLIDE-PUZZLE

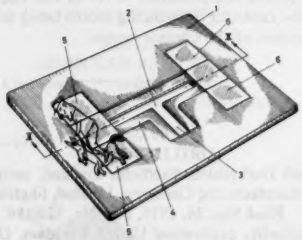
Marc Francois DeVos, Binnenhof 3, Knokke-Heist, Belgium, and Hoan Giok Gouw, Porto Buenolaan 16, Ouderkerk a,d Amstel, Netherlands

Filed Aug. 23, 1976, Ser. No. 716,878

Claims priority, application Netherlands, Aug. 28, 1975, 7510190

Int. Cl.[2] A63F *9/08*

U.S. Cl. 273—153 S **1 Claim**



1. A slide puzzle comprising, in combination, a plate having a space therein with inwardly directed flanges extending along the inner surface of the part of said plate which forms the perimeter of said space, a plurality of slide pieces each having a circumferential groove in the side thereof, said slide pieces being slidably retained in said space by means of said circumferential grooves interengaging at least two of said flanges, said slide pieces being of such dimension that the surfaces thereof lie in the same plane as the surface of said plate, said space being of substantially I-shaped configuration including a leg and two transverse portions, said transverse portions being dimensioned to accommodate three or a larger odd number of slide-pieces which are positioned in side by side abutting relationship in a row, said leg having an opening in communication with the middle thereof, said opening being dimensioned to accommodate one slide piece, the total number of slide pieces being equal to the sum of the slide pieces that said two transverse portions can accommodate, said slide pieces having part of a picture on both surfaces thereof and said plate having part of a picture on the surfaces of the plate adjacent to the transverse portions of the space such that when the slide-pieces are positioned in side by the abutting relationship in the correct sequence in each transverse portion, two complete pictures are shown on one surface while on the reverse surface no coherent pictures are shown.

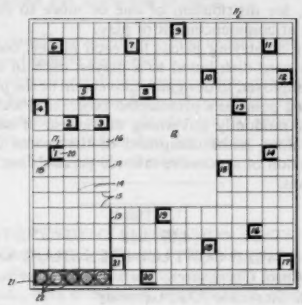
4,097,050
BOARD GAME APPARATUS

Mason D. Miller, 821 Payson St., La Verne, Calif. 91750

Filed May 16, 1977, Ser. No. 797,053

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—243 **6 Claims**



1. A game comprising
playing pieces for respective ones of different players,
a playing board having a central area,
a plurality of contiguous squares on said board surrounding said central area,
certain of said squares comprising starting positions for respective ones of said playing pieces,
certain of said squares being progressively numbered,
said numbered squares being marked to form cells,
each of said cells having an entrance on one side only,
a selection device for randomly selecting the number of squares said playing pieces are to be advanced in turn from said starting positions around said central area,
a registering device for indicating throughout the game the highest numbered cell to which any player has advanced,
said registering device having a plurality of registering elements, and
indicia identifying said registering elements with corresponding ones of said numbered squares.

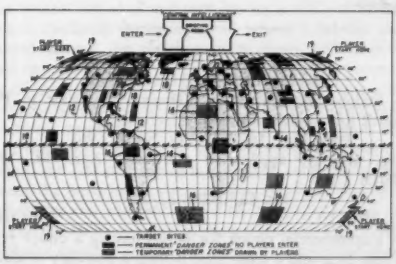
4,097,051
BOARD GAME APPARATUS

Robert M. Goldberg, 1321 Dutch Broadway, and John R. O'Connor, 74 Jackson Rd., both of Valley Stream, N.Y. 11581

Filed Nov. 11, 1976, Ser. No. 740,809

Int. Cl.[2] A63F *3/04*

U.S. Cl. 273—254 **9 Claims**



1. Game apparatus for play by two or more players, comprising:

a game board on which is imprinted an unlegended map of at least a portion of the earth's surface, including latitude parallels and longitude meridians at intervals of predetermined indicated degree spacing dividing said map into spaces formed by the intersection of said latitude parallels and longitudinal meridians, and a plurality of indicia on said map designating unidentified preselected target sites within respective ones of said spaces and representing real locations on the earth's surface,

a first plurality of mission cards, each of which bears a written clue to the identity of one of said preselected target sites and the nature of a mission to be performed thereat, for distribution of one or more to each of the players at commencement of play,

a plurality of playing pieces for each player, one for each mission card distributed to a player, each of said pieces being employed to designate movement of the player from a starting point to a preselected target site, and

means for randomly governing movement of said playing pieces along paths comprised of the spaces formed by intersection of successive latitude parallels and longitude meridians.

4,097,052

GAS-SEALED CONTACT-FREE SHAFT SEAL

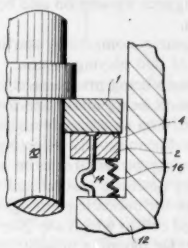
Manfred Heinen, Oberhausen, Germany, assignor to Gutehoffnungshutte Sterkrade A.G., Germany

Filed Mar. 8, 1976, Ser. No. 664,811

Claims priority, application Germany, Mar. 8, 1975, 2510196

Int. Cl.[2] F16J *15/34*

U.S. Cl. 277—96.2 **2 Claims**



1. A seal for high speed shafts, comprising a shaft, a shaft ring tightly mounted on and circularly embracing the shaft, a packing ring, support means elastically suspending said packing ring in a gas-proof enclosure around said shaft, said shaft ring and said packing ring being separated by a narrow sealing gap defining a gas cushion, said shaft ring being made of hardened beryllium copper containing from 1 to 4% of beryllium and from 0.1 to 0.5% cobalt, said packing ring being of aluminum material which has a surface opposed to said shaft ring which is provided with a hard oxide layer of said aluminum extending over at least a portion of the area of said packing ring surface.

4,097,053

HIGH SPEED POWER CHUCK

Joseph Steinberger, Dusseldorf, Germany, assignor to Paul Forkardt Kommanditgesellschaft, Germany

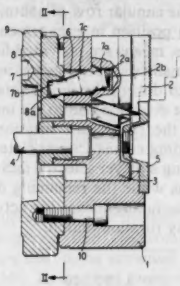
Filed Mar. 16, 1977, Ser. No. 777,961

Claims priority, application Germany, Apr. 30, 1976, 7613635[U]

Int. Cl.[2] B23B *31/16*

U.S. Cl. 279—1 C **4 Claims**

1. In a commercial chuck for lathes having a chuck body with a rear face and a front face having a plurality of chuck jaws therein, the chuck jaws radially movable in the chuck body, chuck jaw movement control means including an axially movable member centrally received in the chuck body operatively connected with the chuck jaws, to radially move the same, the improvement of, in combination with the above, centrifugal balancing means including a plurality of axial holes through said chuck body open to a rear face of the chuck body, one of each holes aligned with one of the chuck jaws, blind holes in rear faces of the chuck jaws communicating with the axial holes in the chuck body, a plurality of radially movable centrifugal weights carried by a weight carrying flange member attached to the rear face of the chuck body the weights being radially movable with respect thereto, the centrifugal



weights positioned on an opposite side of the axial bores from the chuck jaws, a plurality of compensating levers with one of said levers received in each of the axial bores and having opposed ends received respectively in the bores of the chuck jaw and the bores in an associated centrifugal weight, a central portion of each compensating lever forming a pivot within the axial bore whereby movement of one end of the compensating lever in a first radial direction will cause movement of the other end of the compensating lever in the opposite radial direction, the centrifugal balancing means being separate from and independent of the control means.

4,097,054

DRILL CHUCKS

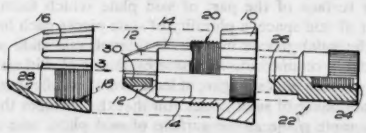
George Cecil Derbyshire, Sheffield, England, assignor to The Jacobs Manufacturing Company, Limited, Sheffield, England

Filed Sep. 24, 1976, Ser. No. 726,184

Claims priority, application United Kingdom, Oct. 7, 1975, 41056/75

Int. Cl.[2] B23B *31/04*

U.S. Cl. 279—64 **9 Claims**



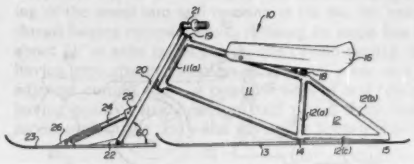
1. A drill chuck comprising at least three jaw elements each having a conical tapered exterior surface of diminishing radii in the direction of the end thereof, a jaw carrier; respective flexible elements connecting said jaw elements to said jaw carrier, said flexible elements each being coextensive in arcuate dimension with the maximum arcuate dimension of the conical jaw element to which it is connected; a nose cone having a frusto-conical bore portion; and means for urging said jaw elements axially relative to said nose cone so that the jaw elements act against the frusto-conical bore portion of the nose cone and are urged radially inwards, accompanied by flexing of the flexible elements, to grip the shank of a drill bit placed in the chuck.

4,097,055

SKI-SUPPORTED VEHICLES

Kevin Wendell Laycraft, 1423 Carlyle Rd. SW., Calgary, Alberta, Canada (T2V 2V2)

Filed Feb. 18, 1977, Ser. No. 769,930
Claims priority, application Canada, Jan. 5, 1977, 26919301
Int. Cl. B62b *13/04*
U.S. Cl. 280—16 **13 Claims**



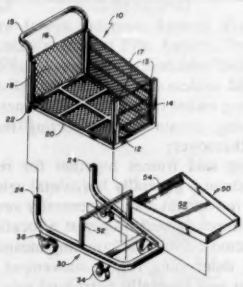
1. A vehicle comprising: a rearwardly inclined supporting frame of closed-loop configuration incorporating a triangulated strengthening segment at the rear end thereof, said triangulated segment including a generally horizontal lower member; a steering mechanism comprising at least one steering column pivotally attached to an upper front portion of said frame, and handle means attached to such steering mechanism; a front ski, pivotally attached to the lower end of said steering mechanism, pivotal movement being constrained by shock absorber means mounted between said ski and said at least one steering column; a rear supporting ski, rigidly attached to said generally horizontal lower member to extend longitudinally thereof such that the front portion of said rear ski extends substantially unsupportedly and forwardly from said lower member and is permitted to flex in response to contact with a snow surface and; seat means resiliently mounted on a upper, rear portion of said frame.

4,097,056

MODULAR PART CART

Paul Eugene Castellano, Wyoming, Minn.

Filed Jan. 3, 1977, Ser. No. 756,413
Int. Cl. B62b *3/02*
U.S. Cl. 280—47.35 **1 Claim**



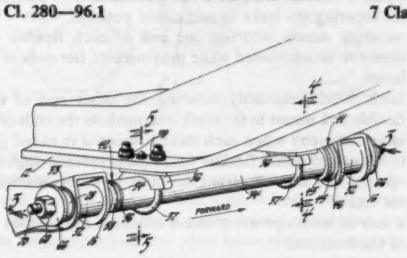
1. A modular part cart for loading, transporting, and unloading of oily industrial parts conveniently, expeditiously and economically comprising:
(a) a lower frame unit;
(b) an upper frame unit slideably mounted over said lower frame unit; and
(c) a drip catch pan inserted between said lower frame unit and said upper frame unit; and
wherein said lower frame unit comprises;
(a) a tubular frame in 'U' shape with perpendicular ends;
(b) a plurality of casters fastened to said 'U' shaped tubular frame in a direction opposite to said perpendicular ends; and
(c) an inverted 'U' shaped support member bridging the width of said 'U' shaped tubular frame;
and wherein said upper frame unit comprises:
(a) a rectangular bottom frame having a mesh;
(b) plurality of perpendicular tubular members fastened perpendicular to said rectangular bottom frame;
(c) a handle fastened to one side of said rectangular bottom frame above said perpendicular tubular members; and
(d) plurality of slideably removeable side panels of mesh for easy loading and unloading of parts;
and wherein
(a) a back panel is pivotally attached to said upper frame unit under said handle via a rod;
(b) said bottom frame of said upper frame unit has additional tubular frame members fastened parallel to its sides; and
(c) said plurality of perpendicular tubular members of said upper frame unit have slots for sliding sections of said plurality of side panels of mesh.

4,097,057

INDEPENDENT SUSPENSION SYSTEM

Stanley R. Goodrich, Jr.; David J. Skolnik, both of Saginaw; Joseph A. Stearns, Frankenmuth; Robert C. Farrell; Richard R. Brezinski, both of Saginaw, and Robert R. Parks, Warren, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1976, Ser. No. 754,280
Int. Cl.[2] B60G *11/42;* **F16F** *1/38*
U.S. Cl. 280—96.1 **7 Claims**



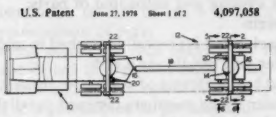
1. In an independent front suspension system for a vehicle having a frame and including a wishbone-shaped control arm having an outer end mounted for pivotal movement on a steering knuckle and spaced apart inner ends each mounted around a control arm bushing including an elastomeric sleeve between outer and inner metal sleeves, the inner sleve being mounted around the end portion of a control arm shaft, a coil spring and a shock absorber mounted between the control arm and the frame, and a road wheel and tire rotatably mounted on the spindle of the steering knuckle, elastomeric isolation means comprising a pair of spaced apart elastomeric bushings secured to the control arm shaft and each having a side wall of reduced effective thickness facing the road wheel, a tubular member mounted around the elastomeric bushings with a predetermined space between the ends thereof and the adjacent inner ends of the control arm bushings, clamping means mounted around the tubular member adjacent each end thereof to secure the tubular member to the frame, a shoulder formed on each end of the control arm shaft adjacent the ends of the tubular member, and end stop means mounted on each end of the shaft between the inner metal sleeve of the control arm bushing and the shoulder and adjacent end of the tubular member to limit axial and lateral movements of the control arm shaft relative to the tubular member as determined by the horizontal distortion of the elastomeric bushings by the movement of the control arm shaft within the tubular member when the road wheel contacts uneven terrain and during braking.

4,097,058

CABLE OPERATED LOG BUNK

Dennis Ray Hassell, 250 Dead Indian Rd., Ashland, Oreg. 97520

Filed Nov. 8, 1976, Ser. No. 739,490
Int. Cl.[2] B60P *7/00*
U.S. Cl. 280—145 **12 Claims**



1. A log bunk assembly comprising:
a. a bunk adapted for mounting transversely of a vehicle,
b. a pair of stakes,
c. pivot means securing the lower end of each stake to an end of the bunk for angular movement between raised and outwardly lowered positions,
d. a pair of flexible link means one associated with each stake for securing the stake in said raised position,
e. securing means securing one end of each flexible link means to its associated stake intermediate the ends of the latter,
f. latch means releasably securing the other end of each flexible link means to the bunk intermediate the ends of the latter, whereby when each stake is secured in raised position the associated flexible link means extends angularly upward and outward from the bunk to its connection to the stake,
g. a pair of latch-operating means mounted one at each end of the bunk and
h. connecting means interconnecting each latch-operating means with the latch means at the remote end of the bunk for alternately shifting the latch means between latched and unlatched positions.

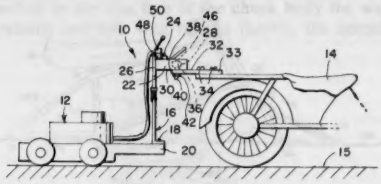
4,097,059

CONNECTING BRACKET ARRANGEMENT FOR TOWING LAWN MOWER

Joseph E. Springer, Sr., Star Rte. 2, Box 2116, Hernando, Fla. 32642

Filed Sep. 27, 1976, Ser. No. 726,495
Int. Cl.[2] B62D *13/00;* **B62K** *27/12*
U.S. Cl. 280—204 **6 Claims**

1. A connecting bracket for connecting a lawn mower to a powered vehicle or the like comprising:
a first elongated bracket for affixment on a first end thereof to a lawn mower resting on the earth;
an engaging element fixedly secured to the second end of said first elongated bracket, said engaging element providing an open-ended chamber on a surface thereof, said chamber opening through said surface;
a second elongated bracket for affixment on a first end thereof to a powered vehicle resting on said earth;
a ball element fixedly secured to the second end of said second elongated bracket, said ball element providing a partially spherical surface dimensioned to be captured within said open-ended chamber;
means for removeably retaining said partially spherical surface within said open-ended chamber, said removeable retaining means providing a bias means urged release lever; and
wherein said first elongated bracket is substantially "U"



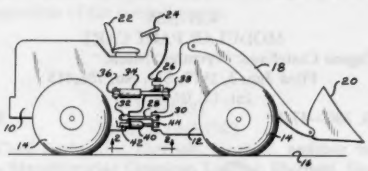
shaped, including a pair of legs having free ends and a base portion, said pair of free ends of said "U" shaped first bracket being fixedly secured to said lawn mower, said base portion of said "U" shaped first bracket being fixedly secured to said engaging element, and wherein said legs of said "U" shaped first bracket are each severed from said base portion and are flexibly reconnected thereto by flexible connecting means.

4,097,060

ROLL STIFFENING AND DAMPENING IN ARTICULATED VEHICLES

Dale H. Unruh, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 30, 1977, Ser. No. 782,668
Int. Cl.[2] B62D *53/00*
U.S. Cl. 280—492 **5 Claims**



1. An articulated vehicle comprising:
first and second vehicle frames;
ground engaging means on each of said frames for emgaging the underlying terrain and supporting the vehicle for movement thereover;
means coupling said frames together for relative rolling movement about a generally horizontal axis and for relative pivotal movement about a generally vertical axis; and
means interconnecting said frames at a location on at least one frame remote from said coupling means for (a) resisting and (b) dampening rolling movement between said frames about said generally horizontal axis.

4,097,061

SKI INSERT FOR ANCHORING A SKI BINDING SCREW IN A SKI

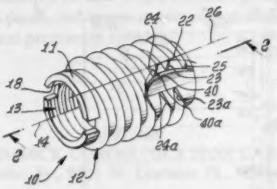
Robert W. Dietlein, 2904 Harmony Pl., La Crescenta, Calif. 91214

Filed Apr. 19, 1976, Ser. No. 677,899
Int. Cl.[2] A63C *5/00*
U.S. Cl. 280—607 **3 Claims**

1. In combination with a ski, a ski insert for anchoring a ski binding screw, the insert comprising
(a) a tubular metallic body having an axis and external and

internal threads extending about said axis and along the body, the ski defining an opening into which said body is closely received, the external thread penetrating the ski about said opening,

(b) the external thread being locally interrupted along an arcuate locus intersecting at least three successive turns to form three chisel cutting edges proximate one end of the body and adapted to cut into the ski material upon twisting of the insert into said opening in the ski, the external thread having opposite flanks defining an angle less than about 31° in axial radial planes, one of said cutting edges having zero spacing from an axial radial plane and two adjacent cutting edges at opposite sides of said one edge having positive spacings from said plane, there being a recess sunk in the body and having an arcuate side wall



adjacent the roots of said three turns, said recess being shallow and having a bottom wall extending from said arcuate wall to the body surface near continuations of said turns, said bottom wall defining a plane generally tangent to terminals defined by said continuations, said recess sized to collect cuttings, the outermost radial dimension of said chisel edges and said continuations closest to said edges being the same as the outer radius of said external thread, said continuations being spaced from said chisel edges by the dimension of said interruptions, said continuations having edges which extend at sharp angles relative to intersecting radii from said axis, and relatively away from said chisel edges, the interruptions of said turns subtending angles substantially less than 90° about said axis,

(c) the internal thread receiving a ski binding screw.

4,097,062

SKI BINDING

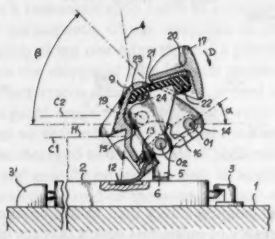
Georges Pierre Joseph Salomon, Annecy, France, assignor to Etablissements Francois et Fils, Annecy, France

Filed Aug. 2, 1976, Ser. No. 710,805

Claims priority, application France, Aug. 28, 1975, 75 26507

Int. Cl.² A63C *9/08*

U.S. Cl. 280—618 **15 Claims**



1. A binding designed to hold a ski boot to a support, such as a ski or a plate mounted upon a ski, said binding comprising:

a mounting secured to said support,

a jaw mounted to pivot about a first axis of said mounting, said axis being parallel to the surface of the ski in such a manner that said jaw is able to move between:

(a) a position in which the boot is held to the support,

(b) a position in which the boot is released;

a boot-removing lever mounted to pivot about a second axis on said mounting, said second axis being parallel with said first axis,

ramp and stop means provided respectively on one of said lever and jaw

and a resilient means urging said ramp and said stop means into contact with each other, said resilient means being attached to said jaw and to said lever in such a manner that it exerts traction between points of attachment of said resilient means to said jaw and said lever and causes automatic closing and opening of said jaw upon actuation of said lever.

4,097,063

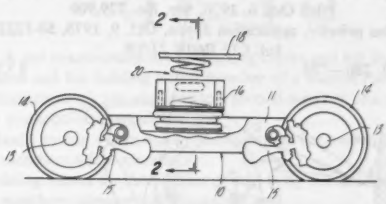
PNEUMATIC COIL SPRING SUPPORT FOR VEHICLES

Albert G. Dean, Narberth, Pa., assignor to The Budd Company, Troy, Mich.

Filed Dec. 27, 1976, Ser. No. 754,873

Int. Cl.² B61F *3/08*

U.S. Cl. 280—712 **4 Claims**



1. Spring means for supporting a vehicle body on a truck, comprising in combination, a pneumatic-coil spring unit having end seats on the truck and vehicle body, said pneumatic-coil spring unit including pneumatic and coil spring components, an intermediate seat plate between said pneumatic and coil spring components of said spring unit, said intermediate seat plate having an elongated rigid lateral stay member including a pivotal connection on the remote end thereof, and pivotal mean secured to said truck for pivotally receiving said pivotal connection and said pivotal connection and pivotal means co-acting for permitting arcuate movement of said intermediate seat plate about said pivotal connection substantially in a vertical direction and restricting any other tilting movement of said pneumatic spring component.

4,097,064

AIR-CUSHION DEVICE WITH A COVER AND A COVER CUTTER

Kazuo Ikawa, and Hideoki Matsuoka, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 28, 1976, Ser. No. 727,613

Claims priority, application Japan, Sep. 30, 1975, 50/117883

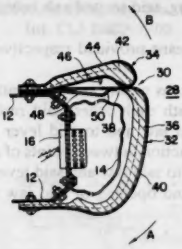
Int. Cl.² B60R *21/10*

U.S. Cl. 280—732 **7 Claims**

1. An air-cushion device having an expansible air-cushion into which a gas generated by a gas generator is fed for expanding said air-cushion to protect an occupant of a vehicle during an accident, said air-cushion device comprising:

cover means for substantially covering said air-cushion in a collapsed condition; and

cutting means for cutting said cover means by the assistance of the expansion of said air-cushion so that said cover



means is broken to allow said air-cushion to get out from said cover means to fully expand.

4,097,065

SAFETY AIR CUSHION BAG IN AUTOMOTIVE VEHICLES

Motohiro Okada; Katsumi Oka, both of Asaka; Kiyoshi Honda, Wako, and Kazuo Matsuura, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Oct. 6, 1976, Ser. No. 729,909
Claims priority, application Japan, Oct. 9, 1975, 50-122279
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—739 **1 Claim**

1. A safety air cushion bag for use in automotive vehicles and the like, which comprises in combination:

(a) a main body of said air cushion bag;

(b) a circular air outlet port formd in one part of said air cushion bag;

(c) a gas-permeable cloth joined to said bag around the periphery of said circular air outlet port, said gas-permeable cloth being stretchable in one direction and being relatively difficult to stretch in a direction at right angles to the stretch direction; and

(d) a dart formed on said gas-permeable cloth which extends through the center of said circular air outlet port, folding lines of said dart being substantially at right angles to the direction in which said cloth is relatively difficult to stretch,

so that said gas-permeable cloth is able to readily conform to the deformation in said air outlet port owing to the stretch of said gas-permeable cloth itself and to said dart.

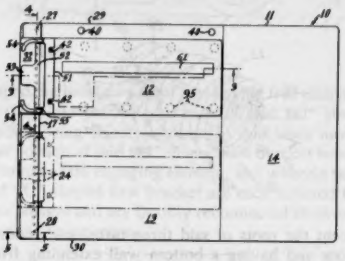
4,097,066

SHEET ENTRY AND AUTOMATIC COPYING APPARATUS

Herbert C. Davis, 6321 Oak Ct., Lakeland, Fla. 33803

Filed Nov. 25, 1975, Ser. No. 635,046
Int. Cl.[2] B41L *3/10*
U.S. Cl. 282—29 B **18 Claims**

1. A sheet entry and automatic copying apparatus for use in making entries on a means which includes a plurality of record sheets with pressure sensitive duplication means therebetween comprising a writing board of a predetermined area, a movable carriage plate being of an area smaller than said predetermined area and positioned above said board, guide means connected to said board for movably mounting said plate to said board, said guide means comprising indexing means for restraining said plate in one and another predetermined selected position with respect to said board, record sheet-positioning means disposed on said board for releasably connecting such record sheet means thereto with such sheet means at least partially overlying said plate and said board, a shield overlying said plate and carried thereby for movement therewith, said shield and plate being adapted to sandwich such record sheet means therebetween, said shield having an opening therethrough for transferring information from pertinent data areas of an entry sheet to such record sheet means, said plate comprising positioning means for positively positioning such entry sheet and



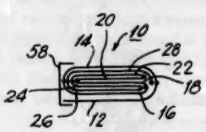
said shield thereon, said shield generally coextensive with and underlying such entry sheet with said shield opening registering with pertinent data areas of such entry sheet, said shield having a solid portion underlying and extending across areas adjacent said pertinent areas of such entry sheet to shield said record sheet means in the areas underlying said areas adjacent said pertinent areas, and a rigid anvil having a shape complementary to said shield opening and of a size smaller than said opening, said anvil being carried by said plate in underlying relation to said shield opening, said anvil being of a thickness generally the thickness of said shield whereby such record sheet means positioned overlying said anvil will be pushed by said anvil into said shield opening generally in the plane of the upper surface of said shield.

4,097,067

PRINTED COUPON FOLDER

Sheldon Schechter, 34 Bush Pkwy., East Brunswick, N.J. 08816

Continuation-in-part of Ser. No. 626,629, Oct. 29, 1975, Pat. No. 4,010,964. This application Jan. 3, 1977, Ser. No. 756,077
The portion of the term of this patent subsequent to Mar. 8, 1994, has been disclosed.
Int. Cl.[2] B42D *15/04*
U.S. Cl. 283—56 **8 Claims**



1. A printed coupon direct mail folder comprising an odd numbered plurality of individual panels that are oblong in plan and equal in size and are attached edge to edge seriatim with their narrow sides in alignment to form a unitary element that is oblong in plan, the long axis of each individual panel being perpendicular to the long axis of said element, each of said individual panels bearing printed promotional material related to an associated saleable item, at least one of said individual panels bearing a printed redemption coupon, said printed coupon providing for the purchase of the associated saleable item

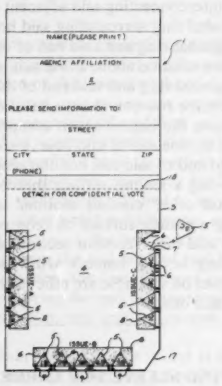
at a predetermined reduction in price, each of said individual panels being connected across said element to an adjacent individual panel by a rectilinear weakened zone, said weakened zones being perpendicular to the long axis of said element, said element being folded by a plurality of parallel over-and-over folds to a member that has the plan size of a single individual panel and a thickness of all of said individual panels combined, said parallel over-and-over folds including a first fold whereby the oblong element is folded to provide pairs of individual panels which are registered in planar parallelism, together with a single endmost panel not in registration with another panel, and with weakened zones being superimposed, and succeeding parallel over-and-over folding of said element at said superimposed weakened zones exclusive of said single endmost panel, terminating with a final parallel over-fold of the element exclusive of said single endmost panel onto said single endmost panel, and means to secure said folder in folded condition against premature opening.

4,097,068

FEED-BACK COMMUNICATION CARD

Robert C. Garnier, Sr., 9611 W. Lorraine Pl., Milwaukee, Wis. 53222

Filed Oct. 14, 1976, Ser. No. 732,371
Int. Cl.[2] B42D *15/00*
U.S. Cl. 283—5 **2 Claims**



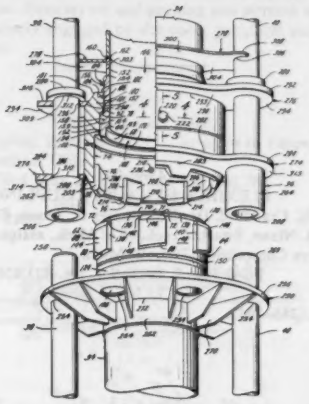
1. Feed-back communication cards to ascertain the views in a meeting of participants, which comprises on the face of the card and at least along one edge thereof a plurality of scored members with the elongated base of each member facing outwardly to effect ready removal of the scored members and leave an elongated space along the facing edge of each card upon removal so that when the cards are stacked the spaces can readily be observed to determine the predominant views of the meeting and quickly provide at least an approximate number of the views expressed on the issue, the base of each scored member being slightly horizontally spaced from the base of each adjacent scored member to provide a spaced area therebetween, and ink marks extending over the extreme edge and edge face of each card in the spaced area between the scored members and horizontally spaced from each other to thereby border each side of a column of assembled card edges within which the spaces appear to readily indicate that the scored members have been removed and for visual tabulation of the views expressed by those present.

4,097,069

MARINE RISER CONNECTOR

Charles D. Morrill, Bellaire, Tex., assignor to McEvoy Oilfield Equipment Company, Houston, Tex.

Filed Apr. 8, 1976, Ser. No. 674,775
Int. Cl.[2] F16L *39/00*
U.S. Cl. 285—84 **33 Claims**



1. A nut combination for supporting choke and kill line pipe sections and for holding a first member of a marine riser connection telescopically engaged to a second member of a marine riser connection, comprising:

a body having a bore axially therethrough for receiving such members telescopically;

holding means on the interior of said body for holding such members telescopically engaged; and

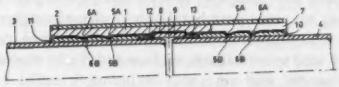
support means for rotatably supporting such choke and kill line pipe sections on the exterior of said body.

4,097,070

HIGH-STRENGTH PIPE COUPLING

Petrus Marinus Acda, Enkhuizen, Netherlands, assignor to Polva Nederland B.V., Enkhuizen, Netherlands

Filed Oct. 27, 1976, Ser. No. 736,156
Claims priority, application Netherlands, Oct. 27, 1975, 7512515
Int. Cl.[2] F16L *21/02*
U.S. Cl. 285—86 **5 Claims**



1. A coupling for high-strength connection of ends of plastic pipe, comprising a spigot portion formed on a pipe end, the spigot portion having a first cylindrical length of outside diameter greater than the pipe outside diameter, and a second cylindrical length having a plain cylindrical surface of lesser diameter than said first cylindrical length and extending beyond the first cylindrical length to the adjacent terminal end of the pipe, said first length having an annular sawtooth groove formed on its outer surface, the slanting side of the sawtooth groove converging toward the said terminal end of the pipe; a coupling sleeve formed of a synthetic resin material and having a center portion having an inner wall, and an end portion, the end portion having an inwardly extending annular ridge with a counter profile to the groove and a plurality of longitudinal slots extending past the ridge but terminating short of the center portion, to permit radial flexing of portions of the end

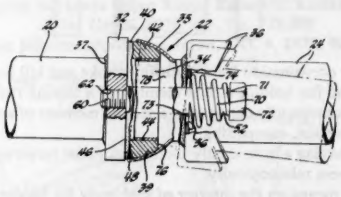
portion between the slots; a seal member arranged between the inner wall of the center portion and the outer cylindrical surface of the second cylindrical length; and a lock member tightly fitted around the coupling sleeve end portion, adapted to be so fitted around the coupling sleeve after insertion of the spigot.

4,097,071

FLEXIBLE EXHAUST COUPLING

Daniel G. Crawford, Dryden; Stanley E. James, Flint, and Donald H. Nixon, Swartz Creek, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 6, 1977, Ser. No. 803,526
Int. Cl.[2] F16L *21/08*
U.S. Cl. 285—94 4 Claims



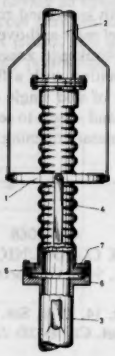
1. A flexible exhaust coupling assembly for maintaining a circumferential seal between pipe segments subject to angular movement therebetween during exhaust flow therethrough comprising: a first pipe, a seal flange supported on said first pipe, means for connecting said seal flange to said first pipe and forming a continuous circumferential gas tight seal between seal load flange and said first pipe, said first pipe having a tubular free end thereon extending axially beyond said seal flange, a second pipe having a flared free end formed continuously circumferentially therearound, said flared free end having a spherical seal surface thereon, a key flange on said second pipe at a point axially spaced from said flared free end to prevent outer radial binding of said free end, means for fixedly securing said key flange to said second pipe segment, a ring seal having an outer peripheral spherical surface thereon impregated with high temperature lubricant material in engagement with said spherical seal surface and freely movable with respect thereto, said ring seal including a radial reference surface sealingly engageable with said seal flange to be located thereby axially with respect to said first pipe, means for spring biasing said flared free end axially against said outer peripheral spherical surface, said last mentioned means including a pair of bolts each having a threaded end thereon engaged with said seal flange and each including a segment freely movable with respect to said key flange and including a heat portion axially spaced with respect to said key flange, compression spring means in engagement with said head and said key flange, said compression spring means being spaced with respect to said key flange to permit angular movement of said first pipe segment with respect to said second pipe segment, said compression spring means biasing said flared free end with respect to said spherical outer surface on said ring seal to maintain a continuous circumferential seal therearound throughout the range of angular movements between the first and second pipes.

4,097,072

CONDUIT WITH CARDAN JOINT

Willem Jan van Heijst, Monte-Carlo, Monaco, assignor to N. V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Continuation of Ser. No. 653,457, Jan. 29, 1976, abandoned. This application Mar. 25, 1977, Ser. No. 781,422
Claims priority, application Netherlands, Jan. 29, 1975, 7501057
Int. Cl.[2] F16L *27/00*
U.S. Cl. 285—114 1 Claim



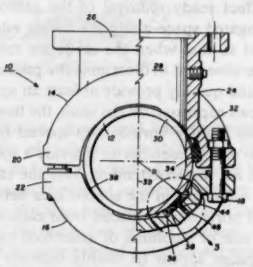
1. In a conduit comprising a pair of rigid conduit sections having ends disposed adjacent each other, a hose extending between and interconnecting said adjacent ends of said conduit sections, a gimbal ring surrounding said hose, means interconnecting said gimbal ring and said end of one said conduit section for relative rotation about a first axis, and means interconnecting said gimbal ring and said end of the other said conduit section for relative rotation about a second axis perpendicular to said first axis; the improvement comprising a first annular flange carried by one end of said hose, a second annular flange carried by said end of said one conduit section, said first annular flange having a sealing surface thereon on the same side thereof as said other conduit section, said second annular flange having a sealing surface thereon on the opposite side thereof from said other conduit section, said sealing surfaces being in sliding sealing contact with each other, whereby torsional stresses on said hose are relieved by the sliding of said surfaces on each other.

4,097,073

TAPPING SLEEVE FOR LARGE SIZE PIPE

Richard George Van Houtte, Bradford, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 22, 1976, Ser. No. 725,207
Int. Cl.[2] F16L *41/00*
U.S. Cl. 285—197 8 Claims



1. A tapping sleeve adapted for mounting onto a pipe section

of contemplated diametral variation per nominal pipe size in which a branch opening is to be formed comprising the combination of complementary sleeve halves adapted to be secured together in substantially encircling relation on the pipe section and a branch connection extending outward from one of said halves to define the location on the encircled pipe at which a branch opening is to be formed, the improvement comprising:

a. support means of substantially inelastic composition to provide added load support for the pipe wall against internally imposed line content forces; and

b. joint means positively attaching said support means for articulated movement on the pipe engaging wall of the other of said sleeve halves.

4,097,074

PIPE JOINT CONSTRUCTION

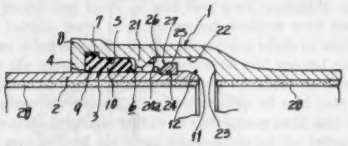
Shozo Nagao; Junkichi Iwamatsu; Hiroshi Kitsukawa; Kozo Nishizaki; Yuichi Watanabe, and Yasunori Okamoto, all of Amagasaki, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed May 23, 1977, Ser. No. 799,329

Claims priority, application Japan, Dec. 8, 1976, 51-148067; Jan. 13, 1977, 52-3330

Int. Cl.² F16L *21/08*

U.S. Cl. 285—231 **8 Claims**



1. In a pipe joint construction comprising a spigot having a taper surface on the outer periphery at the front end, a socket having a first projection on the inner periphery at the open end adapted to be loosely fitted over said spigot, an annular groove disposed adjacent the inner side of said first projection and a packing seat formed adjacent the inner side of said annular groove, and a packing having a back-up portion with a fitting portion projecting from its outer periphery for fittng in said annular groove and a seal portion adapted to be interposed in squeezed condition between said packing seat and the outer peripheral surface of the spigot, the inner peripheral surface of said packing tapering from the end edge of said back-up portion toward the seal portion, the improvement comprising:

(a) said packing seat being formed as an internal cylindrical surface extending from said annular groove inwardly of the socket;

(b) a secnd projection formed on the socket at the inner end of said packing seat and projecting toward the spigot;

(c) a step surface provided on the socket in inwardly spaced relation to said second projection, said step surface being opposed to the front end of the spigot;

(d) an annular seat provided in the outer peripheral surface of the spigot adjacent the front end thereof, a radially contractible lock ring fitted in said annular seat, said lock ring being disposed between said second projection and said step surface and being engageable with said second projection upon relative axial separating movement between the socket and spigot, and fastening means for preventing disengagement of said lock ring from said annular seat;

(e) the socket having an inner peripheral surface extending axially from said second projection towards said step surface, said inner peripheral surface having a diameter such as to provide an annular clearance space with the outer periphral surface of the spigot for passage of said lock ring and such as to provide a radial clearance with the lock ring for relative bending movement between the socket and the spigot;

(f) the axial length of said inner peripheral surface being equal to the sum of the distance between the front end of the spigot and the lateral surface of the lock ring opposed to said second projection and a distance provided for all allowable relative axial movement between the socket and the spigot; and

(g) said inner peripheral surface of the packing tapering inwardly of the socket from a maximum diameter of at least equal to the inner diameter of said first projection to a minimum diameter on said packing seal portion which is compressively engaged by the outer periphral surface of the spigot.

4,097,075

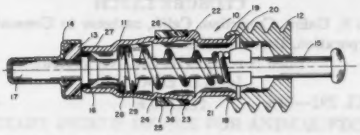
TIRE VALVE CORE

Russell K. Clayton, Rougemont, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 26, 1977, Ser. No. 800,767

Int. Cl.² F16L *25/00*

U.S. Cl. 285—332.3 **5 Claims**



1. In a tire valve core including a tubular barrel and an externally threaded head, the tubular barrel terminating at one extremity in an outwardly directed enlarged flange receivable within said head and said head being provided with a relatively thin annular wall portion terminating in an inwardly directed extremity to insure retention therein of the annular flange on said tubular barrel, a gasket receiving area formed on said tubular barrel substantially centrally of the length thereof, said gasket receiving area being bounded by substantially perpendicular wall portions formed on said barrel to define first and second shoulders spaced apart along the length of said barrel, and a gasket surrounding said barrel and received between said first and second shoulders; the improvement wherein said gasket receiving area of said barrel is defined by a first annular sealing surface, a second annular sealing surface of smaller diameter than the first sealing surface, a third annular sealing surface of smaller diameter than the second sealing surface, a first beveled transition area connecting said first and second sealing surfaces, and a second beveled transition area connecting said second and third sealing surfaces.

4,097,076

FITTING PIECE FOR RIGID OR FLEXIBLE TUBES

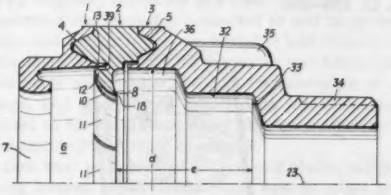
Helmut Wackenreuther, and Alexander Svec, both of Krems, Austria, assignors to Oesterreichische Salen-Kunststoffwerk Gesellschaft m.b.H., Vienna, Austria

Filed Feb. 19, 1976, Ser. No. 659,359

Claims priority, application Austria, Feb. 25, 1975, 1444/75

Int. Cl.² F16L *19/06*

U.S. Cl. 285—340 **9 Claims**



1. A fitting piece for connecting rigid or flexible tubes which are made of plastic, said fitting piece including a body having

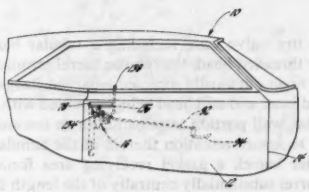
an opening to receive therein an end of the tube and being provided with at least one radially inwardly protruding annular rib having a base portion and a sharp tip, said rib being divided into segments by radial slots and tapering in cross-section from its base toward its tip, said tip being adapted to contact the surface of the tube when the tube is inserted into said opening, the center line of the cross-section of the rib passing through said tip and the center point of the rib base forming an acute angle with the axis longitudinal of said opening, the vertex of said angle pointing to the interior of said opening, said rib and the portion of the body of the fitting surrounding said rib being made of one piece and the rib base adjoining said body being provided on the side facing toward said opening with an axially extending annular slot which extends approximately through half the cross-sectional width of the rib base.

4,097,077

CLOSURE LATCH

James S. Gahrs, Cupertino, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1976, Ser. No. 739,101
Int. Cl.² E05C 3/26
U.S. Cl. 292—216 **3 Claims**



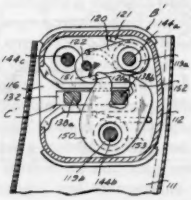
1. A closure latch comprising in combination, a bolt movable between latched and unlatched positions, detent means for maintaining the bolt in the latched position, outside operating means, locking means incuding a locking lever for selectively coupling and uncoupling the outside operating means and the detent means, an inside operator, means coupling the inside operator to the outside operating means, and means interconnecting the inside operator and the locking means for operating the locking means to selectively couple the inside operator to the detent means upon operation of the inside operator.

4,097,078

DOOR LOCK FOR AUTOMOTIVE VEHICLE

Albert Tack, and Friedrich Gabel, both of Wuppertal, Germany, assignors to Firma Tack & Gabel, Wuppertal, Germany

Continuation-in-part of Ser. No. 514,894, Oct. 15, 1974, Pat. No. 3,997,202, which is a continuation of Ser. No. 330,488, Feb. 8, 1973, abandoned. This application Mar. 9, 1976, Ser. No. 665,261
Claims priority, application Germany, Feb. 8, 1972, 72046130[U]
Int. Cl.² E05C 3/26
U.S. Cl. 292—216 **7 Claims**



1. A door-lock assembly for an automotive vehicle provided with a post on the vehicular frame and a door having a panel with a post-confronting surface, comprising:

a key member fixedly mounted on said post;

a keeper on said post-confronting surface of said panel at the level of said key member, said keeper having an outer wall spaced from said surface and formed with a keyway receiving said key member upon closure of the door;

a plurality of fastening elements securing said keeper to the door, said fastening elements penetrating said panel and traversing the space between said wall and said surface;

detent means in said space engageable with said key member, said detent means including a swingable catch fulcrumed on one of said fastening elements; and

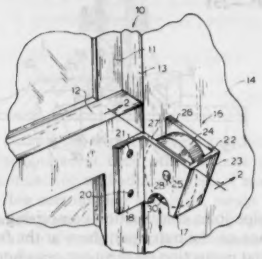
control means secured to said door for alternately locking and releasing said catch.

4,097,079

WINDOW LOCKING APPARATUS

Jean Louis Flynn, P.O. Box 1868, Deland, Fla. 32720

Filed Feb. 28, 1977, Ser. No. 772,726
Int. Cl.² E05C 19/04
U.S. Cl. 292—239 **3 Claims**



1. A window locking mechanism comprising in combination:

bracket means having a flanged portion attachable to a window and having a supporting portion protruding over a window frame, when said flanged portion is attached to a window, said supporting portion having one angled side, and a supporting pin attached thereto; at least one disc shaped locking member rotably supported in said supporting portion on said supporting pin of said bracket means and being linearly shiftable therein, whereby said locking disc member will wedge between said angled member of said supporting portion of said bracket means and a window frame when said flanged portion is attached to a window having an opening force applied thereagainst; said locking member having a large center opening, larger than said supporting pin to thereby allow said disc to rotate on said supporting pin and to be lifted linearly thereon; and said bracket means supporting portion having an arcuate portion formed therein with said locking member protruding thereinto so that an operator's finger can lift the locking member for disengaging the window locking mechanism.

4,097,080

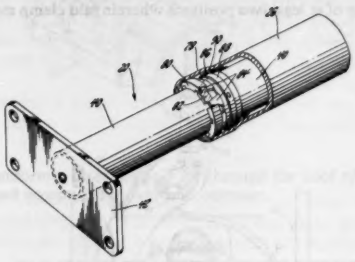
TELESCOPING ENERGY ABSORBER WITH ANTI-ROTATIONAL INTERLOCK FOR VEHICLE BUMPERS

Ronald G. Petry, Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 28, 1977, Ser. No. 781,551
Int. Cl.² B60R 19/06
U.S. Cl. 293—85 **3 Claims**

1. An energy absorbing system for a vehicle comprising a vehicle frame having left and right longitudinally extending side rails, a pair of telescoping energy absorber units for said

side rails, each of said energy absorber units comprising a first tubular part secured to an associated side rail and a second tubular part telescopically mounted with respect to said first tubular part and projecting longitudinally outwardly beyond one end of said associated side rail, a substantially rigid and laterally extending bumper beam spanning one end of said side rails and operatively connected to said second tubular part of each of said energy absorber units to thereby interconnect said side rails, said first tubular part having a plurality of axially projecting teeth, said second tubular part has a plurality of axially projecting teeth secured thereto adapted to mesh with



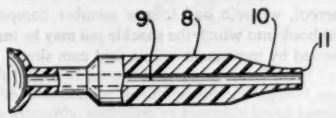
the axially projecting teeth of said first part, yieldable means urging said tubular parts to an extended position with respect to each other whereby said axially projecting teeth of said first part engage the axially projecting teeth of said second part to lock said tubular parts against relative rotation to thereby minimize independent oscillatory movement of said side rails and increase the torsional rigidity of said frame until said teeth of said first and second parts are disengaged by the telescopic collapsing movement of said tubular parts with respect to each other in response to impact of said bumper beam causing said bumper beam to move toward said side rails.

4,097,081

DEVICE FOR INSERTING AND REMOVING CONTACT LENSES

Robert C. England, 6710 C.R. 191, Bellevue, Ohio 44811

Filed Jul. 14, 1977, Ser. No. 815,679
Int. Cl.[2] A61F *9/00*
U.S. Cl. 294—1 CA **7 Claims**



1. A device for inserting and removing contact lenses comprising:

an elongated cylindrical body of resilient material having a forward end and a distal end;

a resilient suction cup coaxial with, and carried by, the body at said forward end and having a concave face facing forwardly of the body;

said body having a through axial duct of small diameter relative to the diameter of the cup, and connected at its forward end with the central portion of said cup and opening at its rear end through the rearmost portion of the distal end of the body;

characterized in that:

said body has a coaxial tapered portion tapering from a location spaced from the distal end to the distal end;

said duct is coaxial with said tapered portion;

said rearmost portion of the distal end of the body is in the form of a relatively small annular contact area surrounding the rear open end of the duct and which can be engaged by one finger of the hand of a user to seal the distal end of the duct while the body is held between the thumb and another finger of said hand;

the taper of said tapered portion, relative to the diameter of the duct, being such that the tapered portion can be compressed to a degree to reduce materially the size and volumetric capacity of the duct, thereby to render more effective the suction created by flexure and self-restoration of the cup resulting from the cup first being pressed against the lens in a direction toward the eye and moved in the opposite direction for withdrawing the lens from the eye by squeezing the tapered portion lightly radially between the thumb and said other finger of the user's hand and holding the tapered portion in squeezed condition while the body is held between said thumb and said other finger and the duct sealed at least near to its distal end.

4,097,082

SANITARY PICKUP DEVICE FOR ANIMAL FECES

Michael J. Orofino, 2 Brookside Dr., Baldwin, N.Y. 11510

Filed Mar. 29, 1977, Ser. No. 782,375
Int. Cl.[2] A01K *29/00*
U.S. Cl. 294—19 R **10 Claims**

1. A portable device for picking up animal droppings and collecting those droppings into a wrapper comprising:

a frame;

a pair of blades pivotally mounted on said frame and each having side edges, an upper edge and a bottom edge;

a blade operating hinge having a pair of arms each having an upper edge and a lower edge with said lower edges each being hingeably connected to a blade top edge;

an operating rod hingeably connected to said hinge upper edges and being movably connected to said frame so that movement of said rod with respect to said frame causes said blade upper edges to move via movement of said hinge, said blades being mounted on said frame to be caused to tilt toward and away from each other by the movement of said upper edges; and

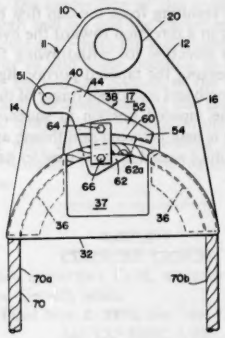
a flexible band positioned to encircle said blades, said band being located adjacent said blade bottom edges to be moved off said blades when said blades are tilted to move said bottom edges toward each other to close the wrapper positioned between said blades.

4,097,083

ADJUSTABLE LIFTING THIMBLE

William H. Schwartz, Novato, Calif., assignor to Roberton & Schwartz, Inc., San Francisco, Calif.

Filed Jun. 15, 1977, Ser. No. 806,741
Int. Cl.[2] B66C 1/12
U.S. Cl. 294—78 A 11 Claims



1. A thimble for lifting a load attached to both ends of a rope, comprising:

a. a frame having means for supporting the rope between the ends thereof, said frame being relatively shiftable along the rope; and

b. means, pivotally mounted to said frame for automatically pivoting when a load is lifted to forceably contact the rope to prevent the relative shifting thereof, said pivoting means including means having a first groove shaped to conform to the circumference of the rope for pressing on the upper rope surface and means defining a passage for receiving the rope therethrough, said receiving means having a surface on which the rope forceably bears downwardly when a load is lifted to pivot said pivoting means and lower said pressing means onto the rope within said first groove.

4,097,084

LIFTING GRAB FOR CYLINDRICAL OBJECTS

John S. Russell, Pittsfield, Me., assignor to Russkraft, Inc., Pittsfield, Me.

Filed Mar. 18, 1977, Ser. No. 779,141
Int. Cl.[2] B66C 1/62
U.S. Cl. 294—104 8 Claims

1. A lifting grab for cylindrical objects comprising in combination,

a hook member for surrounding closely about a circumferential arc an angle of more than one-quarter of the circumference of said cylindrical object of a predetermined diameter,

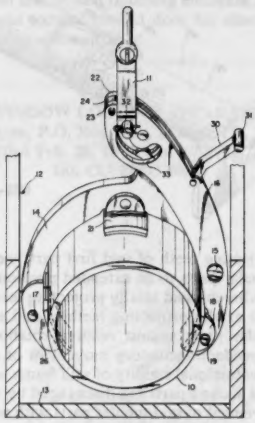
a clamp member pivoted off center at a pivot position near one end of the hook member with a shorter portion continuing from said hook member closely about the circumference of said cylindrical objects therewith together to encompass closely about said cylindrical objects a grasping circumferential arc of more than half its circumferential span and with a longer portion extending to an extremity lifting portion substantially located on a vertical diameter through an encompassed said cylindrical object which substantially bisects said grasping arc,

a set of at least two cylinder grasping pads pivoted at pad pivot positions near the respective ends of said hook and clamp members when placed in said grasping arc and having a facing curvature substantially conforming to the outer circumference of said cylindrical objects whereby the pads pivot on the ends of said clamp and hook members when the clamp and hook members are lowered vertically over the horizontal diameter of said cylindrical object thereby to maintain said clamp and hook members at a closer distance away from the circumference of the cylindrical object than possible with stationary pads,

and whereby when said clamp member is lifted vertically by said lifting portion the pads pivot about their said pivot positions and the clamp member pivots at its pivot position thereby causing said pads to grasp said cylindrical object below a horizontal diameter thereof,

a cam slot in said clamp member near said extremity lifting portion,

a shackle coupled to said cam slot to move therein over a range of at least two positions wherein said clamp member



comprises a pair of spaced plate members each with a registering said cam slot, said shackle is coupled by a shackle pin extending through both plates,

a tongue member extending from said hook member to engage and hold shackle pin when said lifting grab is in an open position just clearing the diameter of said cylindrical object with said pads, wherein the hook member is located at substantially a line on the center of gravity of said clamp member thereby to permit vertical movement down over said cylindrical object without force or movement thereof, wherein said tongue member comprises a C-shaped hook into which the shackle pin may be inserted and removed by movement within said cam slot.

4,097,085

TRACTOR

Arnold Eugene Nelson, Havre, Mont., assignor to Harmon's Northern Mfg., Inc., Havre, Mont.

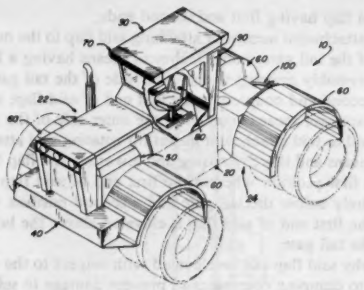
Filed Aug. 10, 1976, Ser. No. 713,102
Int. Cl.[2] B62D 27/00
U.S. Cl. 296—28 C 21 Claims

1. An improvement to a tractor having an air conditioned cab over the operator, said improvement comprising:

means for cooling the air in said cab, and

a dome-shaped roof formed under the top of said cab, said roof having a plurality of downwardly directed holes

formed in uniform distribution therein, said holes being receptive of said cooled air from said cooling means for



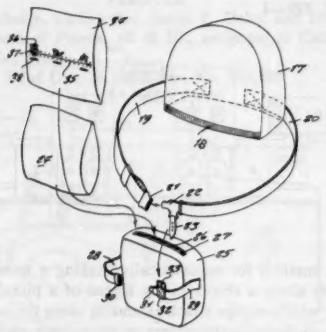
uniformly directing said air through the roof of said cab and downwardly over said operator.

4,097,086

BUS CHAIR PILLOW SLEEPING DEVICE

M. Louise Hudson, 3544 Brenton Ave. - Apt. B, Lynwood, Calif. 90262

Filed Jun. 27, 1977, Ser. No. 810,421
Int. Cl.[2] A47C 7/62
U.S. Cl. 297—217 3 Claims



1. A bus chair pillow sleeping device for use by travelers in vehicles, comprising, in combination, a support assembly and a pillow assembly, said support assembly being supportable upon a backrest of a passenger chair, said support assembly having said pillow assembly attached thereto; said support assembly including a hood for fitting over an upper end of said chair backrest, a pair of straps secured at their one ends to a rear side of said hood, opposite ends of said straps being engagable together, and incorporating means for attachment to said pillow assembly, said means comprising a latch tongue on an end of one said strap having a short strap extending at right angle therefrom that engages said pillow assembly.

4,097,087

CHAIR WITH ADJUSTABLE BACK SUPPORT CUSHION

Marco F. Garavaglia, 867 Briarcliff Dr., Grosse Pointe Woods, Mich. 48236

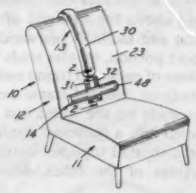
Filed May 13, 1977, Ser. No. 796,838
Int. Cl.[2] A47C 3/00
U.S. Cl. 297—284 9 Claims

1. In a back assembly for a chair, the combination comprising:

(a) a back portion;

(b) a transversal lumbar support cushion;

(c) means for adjustably mounting said transversal lumbar support cushion on said back portion for selective adjustment up and down longitudinally of the back portion and toward and away from said back portion; and,



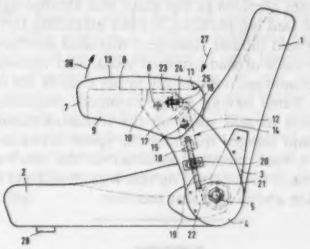
(d) a centrally disposed, longitudinal spine support cushion fixedly mounted on said back portion in a position above the transversal lumbar support cushion and extending to the top end of the back portion.

4,097,088

ARM REST ASSEMBLY FOR A SEAT, PARTICULARLY A DRIVER'S SEAT

Hermann Meiller, Amberg, Germany, assignor to Willibald Grammer, Amberg, Germany

Filed Nov. 3, 1977, Ser. No. 848,121
Claims priority, application Germany, Aug. 13, 1977, 7725186[U]
Int. Cl.[2] A47C 7/54
U.S. Cl. 297—217 10 Claims



1. An armrest assembly for seats, comprising an armrest, a supporting lever for said armrest, means pivotably connecting said armrest to said supporting lever near one end thereof, hinge means near the other end of said supporting lever adapted to mount same for swinging motion between first and second limiting positions, releasable locking means adapted to secure said supporting lever in a position intermediate said first and second limiting positions, and means limiting pivotal motion of said armrest between an inoperative position at which said armrest is disposed substantially as a longitudinal extension of said supporting lever and an operative position at which said armrest extends transversely to said supporting lever when the latter is in its said intermediate position.

4,097,089

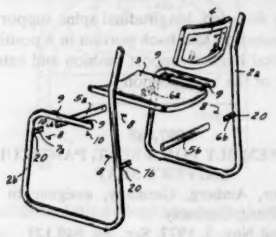
CHAIR ASSEMBLY FOR AN INCREMENTAL PLATING HAVING A TELESCOPING SLEEVE-LIKE CONSTRUCTION

Warren D. Petersen, St. Charles, Ill., assignor to Burd, Inc., Howell Division, St. Charles, Ill.

Filed Nov. 8, 1976, Ser. No. 740,025
Int. Cl.[2] A47C 1/12
U.S. Cl. 297—447 11 Claims

1. A chair frame which comprises a pair of tubular end frames each formed from a single piece of bent metal tubing of generally C shape with a bottom horizontal front to rear por-

tion, an upstanding rearwardly sloping front leg portion at the front end of the bottom portion, a rearwardly extending horizontal seat support portion at the upper end of said front leg portion terminating in a free end, a forwardly sloping upstanding rear leg portion at the rear end of the horizontal bottom portion projecting above the free end of said horizontal seat supporting portion and inclined rearwardly at its top end to form a back support portion, tubular studs welded to said front and rear leg portions of each end frame and projecting laterally therefrom, the studs on one end frame being in mirror image relation with the studs on the other end frame, said tubular studs being crimped into a flattened configuration with front and rear side walls abutted together between the arcuate top and bottom portions of the tubes, front and rear tubular



stretchers between said end frames having hollow ends telescoped over the respective crimped studs on the front and rear leg portions of said frame in snug engagement with the arcuate top and bottom portions of the studs and abutted against the inner faces of said leg portions, screws extending through the back sides of said tubular stretchers threaded into both of the abutted side walls of said crimped studs, said rearwardly extending horizontal portions on the upper ends of the front legs of each end frame having flange members projecting in the same directions as said studs on the frame members, a seat secured on said flanges spanning the space between the end frames, and a back member mounted on the rearwardly inclined portions of the upstanding rear legs of said end frames in spaced relation above said seat member.

4,097,090

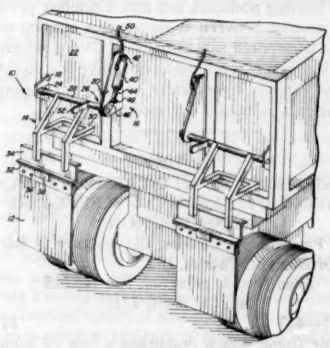
FLAP RETRACTION SYSTEM

Cecil Payne, 1515 E. Bilby Rd., Tucson, Ariz. 85706, and Paul E. Payne, 1415 Maxmillian Pl., Tucson, Ariz. 85704, assignors to Cecil Payne; Paul Payne and Paula Fletcher, all of Tucson, Ariz., part interest to each

Filed Jun. 10, 1977, Ser. No. 805,282

Int. Cl.[2] B62D *25/16*

U.S. Cl. 298—15 G **10 Claims**



1. A retractable flap system for a dump truck including a dump box and a tail gate pivotally coupled to the upper portion of the rear end of the dump box, the tail gate having an outer side and a bottom, said flap retractor comprising in combination:

(a) a flap having first and second ends;

(b) attachment means for attaching said flap to the outer side of the tail gate, said attachment means having a first end pivotably coupled to the outer side of the tail gate and a second end coupled to the first end of said flap; and

(c) actuator means coupled to the outer side of the tail gate and to said attachment means for rotating said attachment means and thereby raising and lowering said flap between a first position wherein the first end of said flap lies entirely below the tail gate and a second position wherein the first end of said flap is elevated above the bottom of the tail gate;

whereby said flap can be elevated with respect to the tail gate prior to dumping operations to prevent damage to said flap.

4,097,091

METHOD AND APPARATUS FOR SECURING MINING MACHINES EMPLOYED ON INCLINED OR STEEP SEAMS

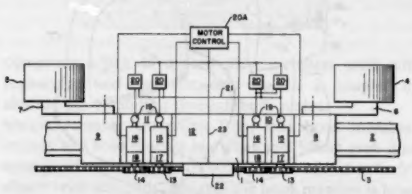
Volker Knorr, Sprockhovel, Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed May 23, 1977, Ser. No. 799,400

Claims priority, application Germany, May 19, 1976, 2622218

Int. Cl.[2] E21C *29/22*

U.S. Cl. 299—1 **9 Claims**



1. A method for automatically braking a mining machine movable along a conveyor by means of a plurality of gearwheels which engage a rack extending along the conveyor and are driven by separate motors on the mining machine; which comprises measuring the rotational speeds of the motors, comparing said rotational speeds, and actuating a brake device to stop movement of the mining machine when the ratio of the speeds of the motors varies.

4,097,092

DISPERSER

Walter Christian Lapple, Alliance, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

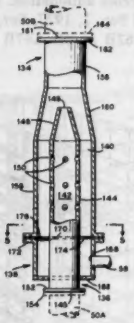
Continuation of Ser. No. 636,859, Dec. 2, 1975, abandoned. This application Mar. 9, 1977, Ser. No. 776,040

Int. Cl.[2] B65G *53/28*

U.S. Cl. 302—25 **2 Claims**

1. In combination with a system for conveying gas entrained particles, the system including a disperser comprising tubular-walled inlet and outlet members, the inlet and outlet members having at least portions thereof concentrically disposed and spaced from one another to form an annular channel therebetween, plate means closing the bottom of the annular channel, the inlet member defining a central channel for admitting gas entrained particles to the disperser, the outlet member having at least one wall opening, and the inlet member having a plurality of wall openings located above the wall opening of the

outlet member, and means communicating with the outlet member wall opening for supplying a pressurized gas to the



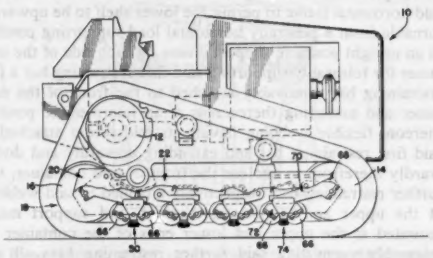
annular channel to disperse the gas entrained particles exiting from said channel.

4,097,093

TRACK GUIDING MEANS FOR A TRACK-TYPE VEHICLE

Robert L. Shelby, Chillicothe; James T. Duke, and Duane L. Parker, both of Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 26, 1976, Ser. No. 735,480
Int. Cl.[2] B62D *55/16*
U.S. Cl. 305—22 10 Claims



1. Apparatus in combination with a track-type vehicle having a track frame and a track assembly mounted on the track frame, said apparatus comprising:

first arm means mounted on the track frame for positioning said apparatus adjacent to the track assembly;

second arm means pivotally mounted on the first arm means and otherwise independent of the track frame for pivoting relative to the first arm means;

roller means rotatably mounted on the second arm means for engaging the track assembly in rolling contact; and

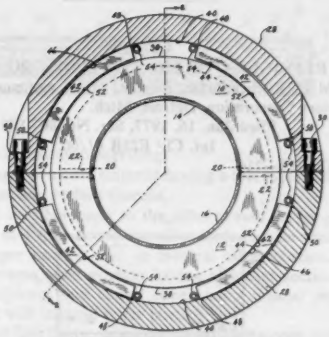
guide means mounted on said first arm means and positioned in straddling relationship relative to a link assembly of the track assembly to limit lateral movement of the track assembly relative to the first arm means, said first arm means comprising first and second link members pivotally mounted on the track frame, and wherein the guide means comprise a first plate fixed to the first link member, a second plate fixed to the second link member, and first and second elongated members secured to the first and second plates and disposed along either side of the track assembly.

4,097,094

JOURNAL BEARING ASSEMBLY WITH FLEXIBLE SUPPORT AND VISCOUS DAMPING

Willis W. Gardner, Waukesha, Wis., assignor to Waukesha Bearings Corporation, Waukesha, Wis.

Filed Aug. 24, 1976, Ser. No. 717,297
Int. Cl.[2] F16C *17/02*
U.S. Cl. 308—9 9 Claims



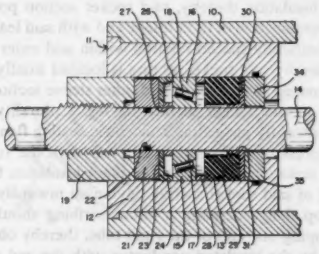
1. An anti-vibration journal bearing with flexible support and viscous damping characteristics and in which the flexible support function is provided separately from the viscous damping function, said bearing comprising annular bearing means for rotatably supporting a shaft, an annular bearing housing surrounding said annular bearing means, means for holding said annular bearing means and said annular bearing housing against relative rotation, a variable clearance space between certain adjacent annular surfaces of said bearing means and housing, and means for introducing oil into said clearance space to provide viscous damping for said bearing means, and spring elements physically separate from the annular bearing means and positioned between certain adjacent other annular surfaces of said annular bearing means and said annular housing for resiliently supporting said annular bearing means within said housing.

4,097,095

PERMANENTLY LUBRICATED BEARING CARTRIDGE

Aaron Zimmer, 6476 Monitor St., Pittsburgh, Pa. 15217

Filed May 12, 1977, Ser. No. 796,143
Int. Cl.[2] F16C *13/02*
U.S. Cl. 308—20 3 Claims



1. A lubricated anti-friction bearing cartridge adapted to fit within a conveyor roll shell comprising a housing, a bearing including coaxial inner and outer bearing races spaced apart to provide a bearing cavity between their bearing surfaces, anti-friction elements disposed between those races, sealing means at each end of those races spaced from them so as to provide a lubricant reservoir at each end of the races and to prevent leakage of fluid out of those reservoirs, and means exerting

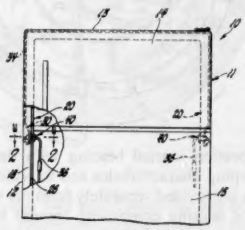
axial pressure on one race, whereby when the lubricant reservoirs are filled to less than their maximum capacity and the bearing is rotated under load the lubricant fluid is thrown outward by centrifugal force and circulates between reservoirs across the inner surface of at least a portion of the outer race in one direction and in the opposite direction through other portions of the bearing.

4,097,096

REFRIGERATOR HEATER TUBE GROMMET

Donald P. Kochendorfer, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 16, 1977, Ser. No. 807,159
Int. Cl.[2] F25B *41/00*
U.S. Cl. 312—214 **2 Claims**



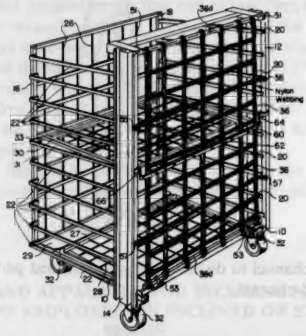
1. In a refrigerator cabinet including an outer shell and an inner liner having an opening, insulation foamed-in-place within the space between the shell and liner, and a rigid tube located in the space between the shell and liner for shielding an insulated electrical conductor, an improved grommet for interconnecting said tube, conductor and liner and for accommodating some misalignment of the tube with respect to said grommet, said grommet being formed as an integral member comprising, an outer sleeve section having spaced apart exit and entrance open ends, an inner socket section having a bore for receiving said rigid tube therein and having spaced apart exit and entrance ends, and a frusto-conical shaped rigid tube lead-in section interconnecting the entrance ends of said outer sleeve and inner socket sections, said outer sleeve section having a pair of axially spaced circumferential flanges formed at the exit end of said outer sleeve section and sized to provide sufficient engagement with the outer and inner surfaces of the liner around said liner opening to prevent leakage of the foamed insulation thereby, said socket section positioned by the interconnection of its entrance end with said lead-in section in concentrically spaced relation within said outer sleeve section, whereby said socket section is located axially intermediate the spaced apart ends of said outer sleeve section, the inner surface of said socket section having a plurality of axially spaced inwardly projecting concentric sealing flanges sized to form a press fit sufficiently tight seal with the rigid tube to prevent leakage of the foamed-in-place insulation thereby, the exit end of said socket section having an inwardly projecting rigid stop flange defining a circumscribing shoulder seating and stopping one end of the rigid tube, thereby obviating any contact by the insulated conductor with the end of the tube, said stop flange having flexible centering means extending inwardly therefrom to define a reduced opening for centering the insulated conductor as it passes therethrough, the interconnection of said socket section with said lead-in section being sufficiently yieldable to permit said inner socket section to move out of concentrically spaced relation with said outer sleeve section while seating said one end of the rigid tube so as to compensate for misalignment of the rigid tube with respect to said grommet.

4,097,097

BULK MAIL CONTAINER

Robert M. Hosko, Stroudsburg, Pa., assignor to Banner Metals Division of Intercole automation, Inc., Compton, Calif.

Filed Sep. 2, 1977, Ser. No. 830,053
Int. Cl.[2] B62B *11/00*; A47B *55/02*; B62B *3/02*
U.S. Cl. 312—250 **2 Claims**



1. A container for bulk mail, and the like, comprising: a lower horizontal frame having a rear member, an open front, and side members which diverge outwardly from the rear member; a plurality of spaced and parallel upright posts mounted on the horizontal frame at the front and rear thereof; an intermediate shelf of generally rectangular configuration having a rear end and a forward end; means pivotally mounting the rear end of the intermediate shelf to the posts at the rear of said horizontal frame to permit the intermediate shelf to be upwardly turnable from a generally horizontal load-supporting position to an upright position; a lower shelf of generally rectangular configuration having a rear end and a forward end; means pivotally mounting the rear end of the lower shelf to said horizontal frame to permit the lower shelf to be upwardly turnable from a generally horizontal load-supporting position to an upright position; support means on each side of the container for releasably supporting said first restraining bar a first restraining bar removably attached to the front of the container and extending thereacross at an intermediate position thereon; flexible webbing having its midsection attached to said first restraining bar and extending upwardly and downwardly therefrom to enclose the front of said container; two further restraining bars respectively attached to said webbing at the upper and lower ends thereof; and support means mounted at the upper and lower ends of the container for releasably supporting said further restraining bars all said restraining bars and flexible webbing forming separately openable upper and lower gates.

4,097,098

BUMPER LOCK FOR DISHWASHING MACHINE RACK SUPPORT

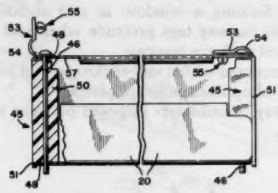
Virgil L. Fields, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jul. 22, 1977, Ser. No. 818,051
Int. Cl.[2] A47B *57/04, 88/04*
U.S. Cl. 312—311 **3 Claims**

1. In an improved track system for a dishwashing machine having a tank defining a cleansing chamber, a rack within said chamber having a bottom portion and parallel spaced side portions, elongated tracks extending adjacent said side portions of said rack, each said track including longitudinally extending guideways one on each side of the track, roller means mounted on said tank and received within one of said guideways of each said track and roller means mounted on each said side portion of said rack and received within the other said guideway of the corresponding said track, and a

bumper member mounted on each end of each said track, the improvement comprising

a retaining tab formed as an integral extension to said bumper member,



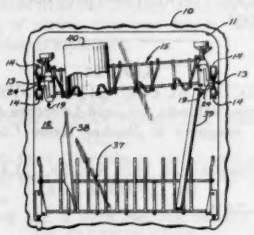
and a lock part on said tab engaged through a hole in said track.

4,097,099

DISHWASHER RACK SUPPORTING AND ADJUSTING APPARATUS

Raymond William Spiegel, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 29, 1976, Ser. No. 756,531
Int. Cl.² A47B *88/00, 95/00*
U.S. Cl. 312—311 **10 Claims**



1. In an apparatus for supporting articles in a dishwasher including an open dishrack having a pair of opposite sides comprising spaced members, rack supporting and adjusting apparatus comprising:

a pair of housings each mounted on one of said opposite sides of said dishrack;

a pair of arms extending in tandem from within each said housing and carrying spaced wheels engaging a supporting guide track that forms a part of said dishwasher;

fulcrum means within said housing for supporting each of said arms for arcuate movement thereof and thus of the said wheels, each arm having an end within the housing comprising a sector gear each lying on an arc substantially concentric with said fulcrum, said sector gears being spaced apart substantially the width of a worm gear;

a worm gear within said housing between and engaging both said sector gears for simultaneous movement thereof on rotation of said worm gear; and

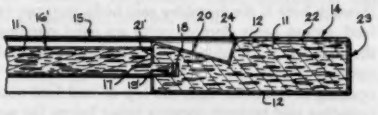
means mounting said worm gear within said housing for externally controlled rotational movement thereof thereby adjusting the arcuate positions of said pair of arms substantially simultaneously.

4,097,100

PANEL ASSEMBLY

Myrl Sauder, Archbold, Ohio, assignor to Sauder Woodworking Co., Archbold, Ohio

Filed Jan. 19, 1977, Ser. No. 760,648
Int. Cl.² A47B *43/00*
U.S. Cl. 312—257 A **8 Claims**



1. A panel assembly comprising,

a center panel of a core material having a thin layer attached to at least one surface thereof,

four frame members next to the sides of said center panel, each of said four frame members including an inner reverse taper portion and an integral outer portion, said inner reverse taper portion having a thicker section disposed adjacent said center panel and a thinner portion adjacent said integral outer portion,

each of said four frame members comprising a core material having a thin surface layer attached to at least one surface thereof,

said four frame members having abutting and connected ends forming a four sided frame,

said four sided frame defining a continuous connector means on its inner periphery,

the outer periphery of said center panel defining mating means received by said continuous connector means for securing and holding said center panel in a self supporting relationship, relative to said four sided frame,

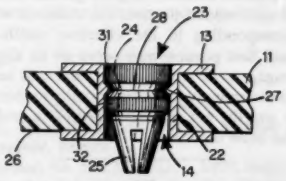
said continuous connector means and said mating means comprising at least one continuous groove and at least one projection received by said groove.

4,097,101

ELECTRICAL INTERCONNECTION BOARDS WITH LEAD SOCKETS MOUNTED THEREIN AND METHOD FOR MAKING SAME

Richard C. Holt, Fairhaven, Mass.; Neil F. Damon, Manville, R.I., and Richard J. Hanlon, Attleboro, Mass., assignors to Augat Inc., Attleboro, Mass.

Filed Nov. 22, 1976, Ser. No. 744,134
Int. Cl.² H05K *1/12*
U.S. Cl. 339—17 C **8 Claims**



1. An electrical interconnection device comprising:

a flat generally rectangular sheet of electrically insulative material;

electrically conductive material secured in discrete areas on at least one side of said sheet, said sheet having a multiplicity of holes therethrough, at least some of said holes normally intercepting one of said areas of electrically conductive material;

electrically conductive plating material on the inside surfaces of at least some of said holes thereby forming plated-

through holes, said plating material being electrically interconnected with said respective intercepted discrete areas of electrically conductive material; and

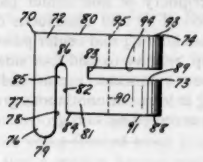
a substantially rigid lead socket force fitted into at least some of said plated-through holes, said socket having a generally cylindrical body portion, said body portion having a roughened surface, whereby upon force-fitting insertion of said socket, some of said plating material in said plated-through hole is displaced by said body portion, each said lead socket being formed with an axial opening therethrough and a plurality of flexible fingers normally converging toward one another at one end and a tapered opening at the other end, the top of said lead socket surrounding said tapered opening being below the surface of said electrically conductive material on said sheet, said tapered opening being adapted to receive an electronic component lead and said fingers being adapted to frictionally engage said lead as it projects through said lead socket.

4,097,102

TELEPHONE CONNECTOR BLOCK HAVING ELECTRICAL CLIP INTERCONNECTING MEANS

Paul V. De Luca, Port Washington, and Albert Atun, Valley Stream, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Jun. 22, 1977, Ser. No. 808,897
Int. Cl.[2] H01R *7/04, 31/08*
U.S. Cl. 339—19 **4 Claims**



4. In a combination electrically conductive elongated pin and a flexible electrical conductor in interconnected relation thereto, the improvement comprising: improved clip means interconnecting said pin and said conductor, said clip including a first member of generally planar configuration and having an elongated slot in the plane thereof, the width of which corresponds to the diameter of said conductor means, said clip having a second member including first and second discreet circular portions in mutually spaced relation, a first portion of which is of internal diameter slightly greater than the internal diameter of said second portion, the diameter of said second portion corresponding to the effective width of said pin, whereby said first portion may serve as an alignment guide upon the engagement with said pin, and said second portion may serve a clamping function, the conductor receiving mouth of said slot and the pin entrance opening in said first portion facing in the same direction.

4,097,103

BUSWAY PLUG ASSEMBLY

Werner A. Krause, Plantsville, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 18, 1977, Ser. No. 798,193
Int. Cl.[2] H01R *7/08*
U.S. Cl. 339—22 B **9 Claims**

1. A busway plug for making an electrical connection with a plurality of taps individually electrically connected to the various busbars of a busway and extending laterally outward from the busway; said plug comprising, in combination:

A. an enclosure;

B. means for mounting said enclosure in juxtaposition with the busway;

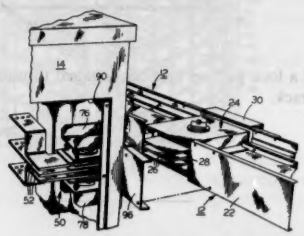
C. a plurality of conductive straps disposed wholly within said enclosure, a different one of said straps associated with each busway tap;

D. means forming a window in said enclosure through which the busway taps protrude when said enclosure is juxtaposed with the busway;

E. a joint mounted within said enclosure, said joint including

1. a pair of opposed pressure plates,

2. an array of insulators disposed between said pressure plates,



3. a pair of conductive splice plates disposed between adjacent pairs of insulators, an associated strap and busway tap being received between each splice plate pair;

4. means forming registered openings in said pressure plates, insulators and splice plates, and

5. a clamping bolt extending through said openings; and

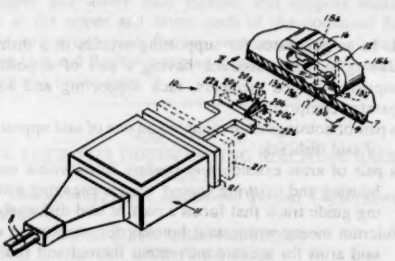
F. means forming an opening in said enclosure to provide access for torquing said bolt to clamp said pressure plates together pursuant to simultaneously perfecting discreet electrical joints between associated ones of said straps and busway taps.

4,097,104

ELECTRICAL CONNECTION SYSTEM

Robert J. Furey, Valdosta, Ga., and Lawrence J. Stupay, Endicott, N.Y., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 4, 1976, Ser. No. 711,456
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—74 R **14 Claims**



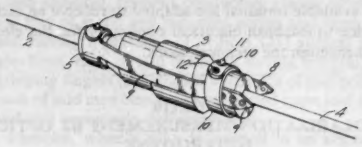
1. An electrical connection system for connecting to a thin metal plate, comprising: a contact member having a tunnel section with electrically conductive contact pillars retaining within the tunnel section, extensions of said contact pillars forming staple-like attachment arms extending outwardly from said tunnel section; and a thin metal plate upon which said contact member is mounted, said staple-like attachment arms extending through said metal plate and being deformed against said metal plate to draw said contact member against the thin metal plate.

4,097,105

HARNESS FOR PLUG AND SOCKET

Floyd A. Zumwalt, Rte. 2 Box 140G, McMinnville, Oreg. 97128

Filed Feb. 4, 1977, Ser. No. 765,863
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 P 2 Claims



1. A harness for attachment to and retention of various sized electrical plug and socket combinations in coupled engagement, said harness comprising,

a primary member of flexible construction including a ring forming member for placement adjacent one end of a plug and socket combination,

elongate flexible members integral at one of their ends with said ring forming primary member and extending outwardly therefrom in a substantially perpendicular manner, said members flexible throughout their length to follow plug and socket contours, said elongate members having segments of reduced crossection whereby a predetermined tensile load applied to said elongate members will cause same to sever at said segments allowing plug and socket separation by manual pulling on the plug or socket in emergency situations,

a secondary member also of flexible construction and adapted for placement adjacent the other end of the plug and socket combination, and

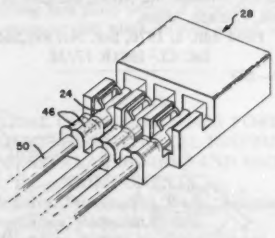
interengageable means carried by end segments of the elongate members and by said secondary member enabling coupling of the primary and secondary members at selected distances from one another whereby coupled plugs and sockets of various sizes and shapes may be retained against accidental separation.

4,097,106

TERMINAL HOUSING HAVING AN INTEGRAL STRAIN RELIEF

William Roderick Over, Harrisburg, and Joseph Agusta Wise, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 4, 1975, Ser. No. 565,283
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—99 R 4 Claims



1. A housing for an electrical terminal, which comprises:

a. a housing of non-conductive material having a passageway for receiving the contact portion of the electrical terminal and a cavity axially positioned behind the passageway for receiving the wire engaging means of the electrical terminal; and

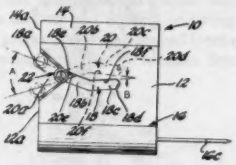
b. a strain relief member unitary with and of the same non-conductive material as the housing and axially positioned behind the cavity, said strain relief member having a channel therethrough for receiving the wire which may be connected to the terminal with the sidewalls of the channel adapted to be cold-formed around the wire in retaining engagement therewith.

4,097,107

INSULATION DISPLACEMENT TERMINAL

Harold G. Hawkins, Bristolville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1976, Ser. No. 748,486
Int. Cl.[2] H01R *11/20*
U.S. Cl. 339—97 R 10 Claims



1. An insulation displacement terminal for piercing the outer insulation of an insulated electrical wire to make contact with the central conductive core comprising:

a unitary sheet metal body having a pair of end plate portions juxtaposed in a closely spaced parallel relationship,

a central spring portion interconnecting parallel laterally extending bottom edges of the plate portions and resisting relative movement of the plate portions in a direction transverse to their interconnected bottom edges, each of said end plate portions including a slot which has an outer open end at a free side edge of its respective plate and an inner closed end spaced therefrom,

said slots each including an outer energizing portion and an inner scissors portion, each of said outer energizing portions being aligned in part with the other and having an edge angled with respect to an edge of the other for scraping a conductor core of an insulated electrical wire and moving said end plate portions relative to each other against the bias of the spring portion responsive to movement of a conductor core of an insulated electrical wire along said edges toward said inner scissors portion,

each of said inner scissors portions having an edge angled with respect to an edge of the other for moving a scraped conductor core of an insulated electrical wire received in said scissors portions from said outer energizing portions along said last mentioned edges and biasing it against the inner closed ends of said slots responsive to relative movement between said end plate portions under the bias of said spring portion.

4,097,108

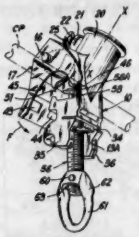
HOT LINE CLAMPS

Marcel Prodel, Arnac Pompadour, France, assignor to Sicame, Arnac Pompadour, France

Continuation of Ser. No. 546,753, Feb. 3, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,955
Int. Cl.[2] H01R *13/00*
U.S. Cl. 339—109 8 Claims

1. An electrical clamp for connecting a branch conductor to a main conductor, comprising a rigid generally U-shaped body having a pair of opposed legs, means for securing a branch conductor on said body, a flap member rockably mounted about one leg of said U-shaped body between an open position for enabling the clamp to be received on a main conductor and a closed position for maintaining the clamp in place on the main conductor, resilient means biasing the flap member toward the open position, a pair of camming surfaces on said

flap member disposed one on either side of said one leg and adapted to cooperate with the main conductor when the clamp is received on the main conductor for rocking said flap member to the closed position before tightening the hold on the main conductor, threaded pressure applying means threadedly received in one leg of said body and in unobstructed facing relation with the other leg of said body for movement towards and away from said body for movement towards and away from said other leg for respectively tightening and loosening the hold of the clamp on the main conductor with the main



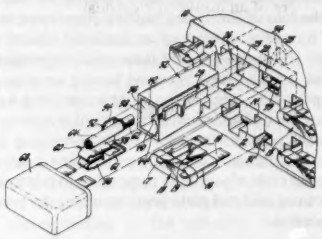
conductor in direct clamping contact with said one leg and said pressure applying means, and an operating member for applying force for rocking said member to its closed position and disposed on said threaded pressure applying member having a first mode of operation for exerting an axial force through said threaded pressure applying member to said flat member, for automatically rocking the latter to its closed position and a second mode of operation for turning the threaded pressure applying member for tightening and loosening its hold on the main conductor.

4,097,109

ACCESSORY ELECTRICAL CONNECTOR

William E. Cross, Brookfield, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 27, 1977, Ser. No. 810,409
Int. Cl.[2] H01R *13/12, 19/40*
U.S. Cl. 339—147 R **4 Claims**



1. An electrical accessory connector for a mounted terminal block having a front opening cavity adjacent an available terminal carried by the mounted terminal block comprising:

a connector body insertable into the front opening cavity of the terminal block, said connector body having a longitudinal cavity having a front opening,

an accessory terminal which is shaped for insertion into the longitudinal cavity via the front opening, said accessory terminal being disposed in the longitudinal cavity and having a body portion, a contact portion which extends from the body portion in a longitudinal direction toward the front opening and which is in lateral alignment with the available terminal when the connector body is disposed in the front opening cavity of the terminal block, and an attachment portion which is spaced from said contact portion in a transverse direction, and

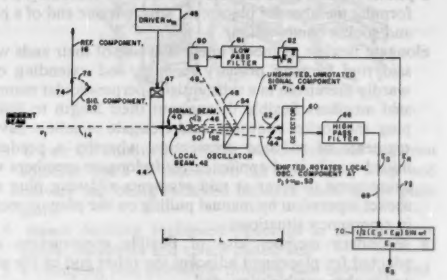
an electrical lead having one end mechanically and electrically secured to the accessory terminal by the attachment portion, said lead extending from the attachment portion in a longitudinal direction past said contact portion and out of the connector body cavity via the front opening whereby upon disposition of the connector body in the cavity of the terminal block, the accessory terminal and the available terminal are adapted to receive an electrical device to establish electrical continuity for the electrical lead through the terminal block.

4,097,110

DEPOLARIZATION MEASUREMENT BY OPTICAL HETERODYNE

Charles Carey, Burlington, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Apr. 27, 1977, Ser. No. 791,365
Int. Cl.[2] G02F *1/11;* **G01J** *4/04*
U.S. Cl. 350—149 **13 Claims**



1. Apparatus for measuring depolarization of a coherent incident beam of light comprising:

a traveling wave/shear wave modulator interposed in the path of said beam for providing an unshifted, unrotated signal beam and a frequency shifted local oscillator beam rotated so that its direction of polarization matches that of said signal beam;

means for selecting said unshifted unrotated signal beam and said shifted rotated local oscillator beam; and

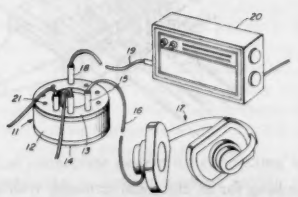
means for optically heterodyning the selected beams and producing an electrical signal representing the result of the heterodyning.

4,097,111

ELECTRICAL CONNECTOR

Roger A. Martin, Swampscott, Mass., assignor to The Murdock Corporation, Chelsea, Mass.

Filed Jun. 1, 1976, Ser. No. 691,565
Int. Cl.[2] H01R *17/18*
U.S. Cl. 339—183 **2 Claims**



1. A distributing station for an audio device whereby the signal coming from the audio device **(20)** can be fed to a plurality of listening devices, such as head sets, **(17)** by detachably connecting plugs **(15)** to said distributing station, comprising:

(a) a rigid, one piece, integral insulating frame **(12)** formed with side walls **(26, 27)** defining open top and bottom

portions, a web (28) extending transversely of and connecting said side walls intermediate said top and bottom portions, and a plurality of plug guide apertures (31) in said web each surrounded by a receptacle defining wall (29) formed on the bottom and top surfaces of said web and extending from said top to said bottom portions;

(b) two identical, resilient conductive plastic members (13, 14) free of metal and mounted across said open portions and having a plurality of orifices (21) aligned with said apertures, each of said members having integral, resilient gripping fingers (23) aligned with each of said orifices, and each of said members being supported upon said side walls and said receptacle defining walls;

(c) whereby, when a plug is inserted in an aligned set of apertures and orifices, the plug is conductively gripped by said resilient fingers to form an electrical connection therewith.

4,097,112

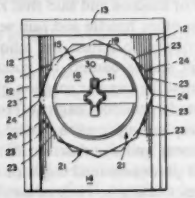
TILTING TERMINAL CLAMP ASSEMBLY

Donald Richard Veldman, Oak Lawn, Ill., and Howard S. Langdon, 1250 Hill Rd., Winnetka, Ill. 60093, assignors to Howard S. Langdon, Winnetka, Ill.

Continuation-in-part of Ser. No. 719,897, Sep. 2, 1976, abandoned. This application May 4, 1977, Ser. No. 793,444

Int. Cl.[2] H01R *9/10*

U.S. Cl. 339—246 **5 Claims**



1. A tilting terminal clamp comprising a threaded shank having a head at one extremity and a lead point at the other extremity, said head being configured to cooperate with a tool whereby the shank may be rotated into or out of a threaded aperture,

a clamping plate substantially centrally apertured to loosely and tiltably receive said shank, said plate having a generally polygonal perimeter with said perimeter being equipped with 6, 8 or 10 flat sides and corners adapted to engage the sidewalls of a standard terminal body pocket receiving said clamp to prevent rotation of said clamping plate while at the same time avoiding the need for carefully orienting said plate within a terminal pocket, and

means for retaining said plate on said shank adjacent said head.

4,097,113

ELECTRICAL CONNECTORS FOR PORTABLE ELECTRONIC PHYSIOLOGICAL INSTRUMENTS HAVING SEPARABLE FIRST AND SECOND COMPONENTS

Stephen L. McKelvy, Woodinville, Wash., assignor to Physio-Control Corporation, Redmond, Wash.

Filed Sep. 3, 1976, Ser. No. 720,148

Int. Cl.[2] A61N *1/36*

U.S. Cl. 339—256 R **4 Claims**

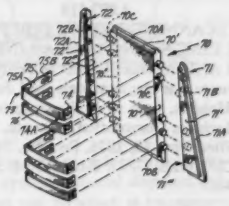
1. An improved electrical connector, for an electronic physiological instrument which is contained within a housing having an exterior housing surface, the housing also having a cut away portion defining a housing aperture connector comprising:

(a) a central contact support member of insulating material, said central contact support member having a substantially rectangular, substantially planar front surface and a pair of opposite, substantially parallel side surfaces bounding said front surface,

(b) first and second contact retaining members, each of insulating material, and each having a substantially planar front surface and an adjoining side surface complementary to one of said pair of side surfaces of said central contact support member,

(c) a plurality of metallic, leaf spring contacts, each of said contacts being formed into a substantial U-shape and thereby having a central, bowed contact portion, and adjoining first and second legs, each of said legs having extending therethrough an aperture, and electrical terminal means being provided on one of said legs,

(d) a plurality of projections formed and extending from the side surfaces of one of said central contact support member or said first and second contact retaining members, said plurality of projections being spaced from each other, and a corresponding plurality of recesses formed in the



side surfaces of the other of said central contact support member or said first and second contact retaining members, said plurality of recesses being spaced apart from each other,

(e) said first and second contact retaining members being secured to said central contact support member, with each one of said plurality of projections passing through one of said apertures in one of said plurality of contacts and being received in a corresponding one of said plurality of recesses to form a connector assembly, said plurality of projections and said plurality of recesses being located so that said front surfaces of said central contact support member and said first and second contact retaining members are substantially coplanar in said connector assembly; and,

(f) means adapted to mount said connector assembly in the housing aperture so that said front surfaces of said central contact support member and said first and second contact retaining members are substantially flush with the exterior housing surface.

4,097,114

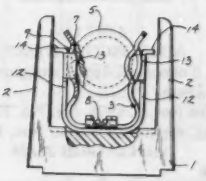
FUSE HOLDER WITH SEPARATE REJECT SPRING

Roger Henwood Motten, Jr., Bowling Green, Ohio, assignor to Marathon Electric Manufacturing Company, Wausau, Wis.

Filed Apr. 28, 1977, Ser. No. 791,795

Int. Cl.[2] H01H *85/24*

U.S. Cl. 339—259 F **1 Claim**



1. A reject device for a fuse clip located in a fuse holder for use with ferrule type fuses having a grooved ferrule on one end

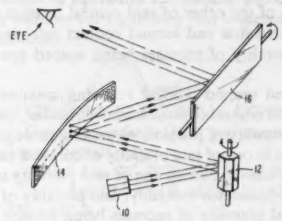
of the fuse to insure that only ferrule type fuses are accepted in the holder, which comprises a separate reinforcing spring assembled around the fuse clip with the clip having slots therein in opposite sides of the walls of the clip and located below the upper ends of the clip, means securing the assembled clip and spring to the base of the fuse holder, inwardly turned horizontally aligned abutments provided adjacent the upper end of the reinforcing spring and of a construction complementary to a groove in a ferrule type fuse which upon assembly with the fuse clip extend inwardly of the clip through the respective slots to dispose the abutments inside the clip and thereby lodge the abutments in the annular groove of a ferrule type fuse when the latter is inserted in the clip, and flange means at the upper ends of the reinforcing spring extending horizontally outwardly therefrom to engage the walls of the holder upon spreading of the fuse clip when a ferrule type fuse is inserted and limit displacement of the abutments inside of the clip to thereby provide for acceptance of only a ferrule type fuse.

4,097,115

OPTICAL SCANNING DEVICE FOR PRODUCING A MULTIPLE LINE SCAN USING A LINEAR ARRAY OF SOURCES AND A TEXTURED SCANNED SURFACE

Richard Lawrence Garwin, Scarsdale, and James Lewis Levine, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1976, Ser. No. 742,935
Int. Cl.[2] G02B *27/17*; H04N *3/34, 3/08, 9/14*
U.S. Cl. 350—6.7 **8 Claims**



1. An optical scanning system for producing a multiple line two-dimensional array of display points comprising:

at least one modulated light source,

a display screen having a textured surface for providing a controlled light scattering,

a first light deflecting means periodically rotating about an axis for scanning said at least one modulated light from said light source source and deflecting said light in a first linear direction across said display screen to produce a display of at least one row of display spots,

and a second light deflecting means periodically rotating about an axis orthogonal to said first deflecting means for scanning said light on said display screen in a second direction to produce a two-dimensional display of spots representative of said at least one modulated light source.

4,097,116

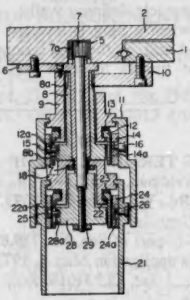
MICROSCOPE STAGE

Noboru Kuroha, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 5, 1976, Ser. No. 739,335
Claims priority, application Japan, Nov. 10, 1975, 50-133968
Int. Cl.[2] G02B *21/26*
U.S. Cl. 350—86 **7 Claims**

1. A microscope stage device comprising a first stage slidable in one direction with respect to the stationary portion of the main body of a microscope, a first rotatable member rotatably supported on a shaft secured to said first stage and threadably engaged with said stationary portion so as to move said first stage upon rotation of said first rotatable member, a second stage provided on said first stage for sliding movement in a direction perpendicular to the direction of sliding movement of said first stage, a second rotatable member rotatably supported on said shaft and threadably engaged with said second stage so as to move said second stage, and a pair of operating handles mounted for rotation about said shaft to individually operate each of said first and said second rotatable member, the improvement residing in:

first and second transmission means provided between one



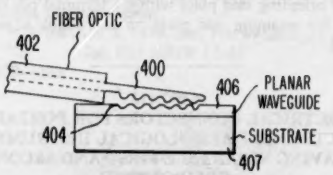
of said pair of handles and said first rotatable member and between the other handle and said second rotatable member, respectively, to adjust the amount of movement of each of said stages caused by rotation of each of said handles so that for angular rotation of each of said handles within a predetermined angle of rotation, each of said stages corresponding to each of said handles is moved for fine adjustment and for rotation of each of said handles beyond said predetermined angle of rotation, each of said stages corresponding to each of said handles is moved for coarse adjustment.

4,097,117

OPTICAL COUPLER HAVING IMPROVED EFFICIENCY

Clyde Carl Neil, Levittown, Pa.; Jacob Meyer Hammer, Lawrenceville, and Robert Alfred Bartolini, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,353
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.17 **5 Claims**



4. In apparatus comprising a planar optical waveguide having a diffraction grating disposed on its surfacae and a fiber-optic core having a coupling portion thereof optically coupled by phase-matched evanescent fields to said planar optical waveguide through said diffraction grating; the improvement therein:

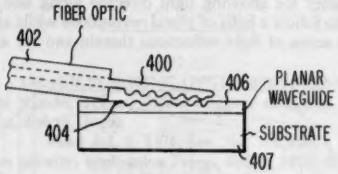
wherein said coupling portion of said core has a contacting surface which is substantially a negative replica of the undulating surface of said diffraction grating, and

wherein said contacting surface of said coupling portion of said core is positioned to substantially fill the crevices of said undulating surface of said diffraction grating.

4,097,118
OPTICAL WAVEGUIDE COUPLER EMPLOYING DEFORMED SHAPE FIBER-OPTIC CORE COUPLING PORTION

Jacob Meyer Hammer, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,354
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.17 3 Claims



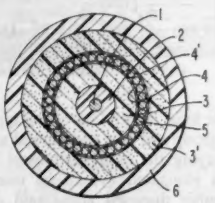
1. A method for increasing the optical efficiency with which a) each of a plurality of different modes of multimode light traveling in a first transmission medium comprising a multimode fiber-optic core having an initially cylindrical shape, and b) light having a given modal characteristic traveling in a second transmission medium comprising a planar optical waveguide cooperatively disposed with respect to a coupling portion of said core, can be coupled between said two transmission media by phase-matched evanescent fields, said method comprising the step of:

flattening out said initially cylindrical shape of said coupling portion of said fiber-optic core in a direction substantially perpendicular to the plane of said planar optical waveguide and fanning out said initially cylindrical shape of said coupling portion of said fiber-optic core in a direction substantially parallel to the plane of said planar optical waveguide to deform said coupling portion of said fiber-optic core into a predetermined spatulate shape that provides more efficient optical coupling by phase-matched evanescent fields of multimode light wave energy between said coupling portion of said fiberoptic core and said planar optical waveguide by forcing said modes of multimode light into a modal distribution similar to said given modal characteristic.

4,097,119
OPTICAL FIBER CABLE

Hiroyuki Kumamaru; Hiromu Shioyama, and Masao Hoshikawa, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 6, 1975, Ser. No. 584,663
Claims priority, application Japan, Jun. 7, 1974, 49-65202
Int. Cl.[2] G02B 5/16
U.S. Cl. 350—96.23 13 Claims



1. An optical fiber cable comprising:

a plurality of bundles of optical fibers,

a strengthening member extending lengthwise along the cable,

low friction thin, polymeric tape slipping layers on respective sides of said bundles of optical fibers to permit slipping movement between said optical fibers and said low friction layers to prevent breakage of said optical fibers under applied stress to said cable,

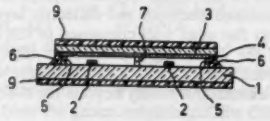
cushion layers disposed on the side of the low friction layers remote from said bundles of optical fibers, and

protection layers underlying the radially innermost cushion layer and overlying the radially outermost cushion layer.

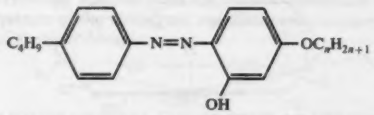
4,097,120
LIQUID CRYSTALLINE COMPOUNDS AND MIXTURES

Jan vanderVeen, and Theodorus Cornelis Jozef Maria Hegge, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 531,087, Dec. 9, 1974, Pat. No. 3,984,392.
This application Jul. 22, 1976, Ser. No. 707,530
Claims priority, application Netherlands, Dec. 13, 1973, 7317074
Int. Cl.[2] C09K 3/34; G02F 1/13
U.S. Cl. 350—350 1 Claim



1. An orientation-type liquid crystal display cell having a layer of a liquid crystal material disposed between a pair of electrodes, at least one of which is transparent, wherein said liquid crystal material consists essentially of at least one compound of the formula

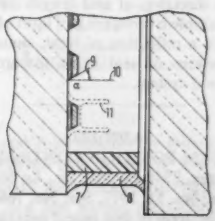


wherein n is 6 or 7.

4,097,121
LIQUID-CRYSTAL DISPLAY WITH BISTABLE CHOLESTERIC LIQUID-CRYSTAL LAYER AND METHOD OF MAKING THE SAME

Miroslav Tauer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 14, 1976, Ser. No. 723,151
Claims priority, application Germany, Sep. 22, 1975, 2542166
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—333 11 Claims



1. A liquid crystal display for the representation of visual images comprising two carrier plates having therebetween in a hermetically sealed arrangement, a layer of cholesteric liquid crystal with a homeotripic wall orientation, each of said carrier plates having a conductor array on its inner surface facing the

other, said liquid crystal having at least in a certain frequency range a positively anisotropic susceptibility, and at field strengths equal to or greater than a first threshold value E_{cn} taking on a homeotropically-nematic texture, in which it remains as long as the applied field is greater than a second lower threshold value E_{nc}, said conductor arrays having at least one separately operable conductor, the electrodes of at least one of the two carrier plates having a dielectric layer thereon, the dielectric constant of which is smaller than that of the LC layer, said dielectric layer being so dimensioned relative to the associated electrode that marginal portions of the latter are exposed, respective marginal portions defining a plurality of picture segments, with said marginal portions defining a marginal zone each of which operatively encircles a respective display segment, which marginal zone during operation of the liquid crystal display, each have a minimum field strength E_r equal or greater than E_{cn}, in the liquid-crystal layer, and simultaneously a holding field strength E_h, lower than E_{cn}, at the location of the picture segment enclosed by the marginal zone, during operation of the liquid crystal display, the marginal edges of the combined electrode and dielectric layers forming an approximately flat edge wall composed of the lower electrode edge and the upper aligned dielectric edge, such edge wall being inclined in the form of a beveled edge whereby the electrode edge extends outwardly beyond the dielectric edge.

4,097,122

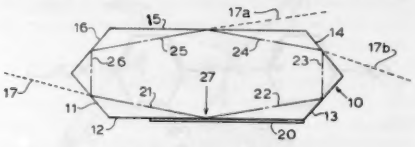
LIGHT OPTIC DATA HANDLING SYSTEM

Joseph T. McNaney, 8548 Boulder Dr., La Mesa, Calif. 92041

Filed Dec. 23, 1976, Ser. No. 753,735

Int. Cl.² G02F *1/34*

U.S. Cl. 350—353 **3 Claims**



1. A light optic data handling system comprising:
a. means for providing a beam of light;
b. means for directing said beam of light along a primary optical path within said system including an array of light reflecting surfaces, each surface presenting a length dimension and each angularly oriented so as to establish an optical relationship one with respect to the other for allowing said beam to be directed along said path forming a helix of plural revolutions, the optical center of said beam of each revolution thereof displaced a predetermined distance one with respect to the other in a side-by-side relationship in the direction of said length dimension, said distance less than a cross sectional dimension of the beam in the direction of said length dimension so as to provide a multiple overlapping of light of said beam along said path and a reflecting of light, simultaneously, from different portions of said beam toward a light output position of said system.

4,097,123

LIGHT BEAM POSITION CONTROL SYSTEM

Joseph T. McNaney, 8548 Boulder Dr., La Mesa, Calif. 92041

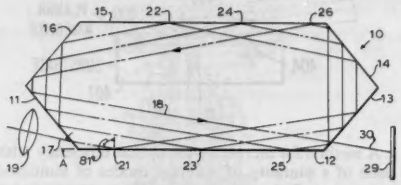
Filed Jan. 31, 1977, Ser. No. 764,408

The portion of the term of this patent subsequent to Jun. 25, 1994, has been disclaimed.

Int. Cl.² G02F *1/16*

U.S. Cl. 350—353 **3 Claims**

1. In a light beam position control system:
(a) a source of light;
(b) an array of light reflecting surfaces;
(c) means for directing light from said source along an input path toward said array of surfaces and thereupon along an optical path within said array extending to a light emitting surface of said array, said light input path optically related through said array to a light output path stemming from said emitting surface, said reflecting surfaces of said array each presenting a length dimension, said emitting surface extended along said length dimension and coinciding with a predetermined one of said reflecting surfaces, each surface of said array angularly oriented one with respect to the other for allowing light directed along said optical path to follow a helix of plural revolutions while undergoing a series of light reflections therein and for allowing



said light during a predetermined one of said revolutions to be directed toward said emitting surface at an angle of incidence thereon for effecting a frustrating of a reflection of light therefrom;
(d) means for directing light from said source along a first optical path within said array of surfaces so as to allow said light to be reflected toward and incident upon a first light output position along said light emitting surface; and
(e) means for redirecting light from said source from said first optical path to and along a second optical path within said array of surfaces so as to allow said light to be reflected toward and incident upon a second light output position along said light emitting surface.

4,097,124

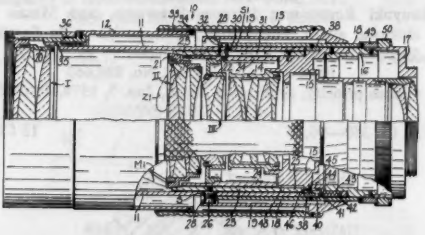
ZOOM LENS

Rinzo Watanabe, and Masatoshi Shimojima, both of Tokyo, Japan, assignors to Vivitar Corporation, Santa Monica, Calif.

Continuation-in-part of Ser. No. 258,816, Jun. 1, 1972, Pat. No. 3,784,285. This application Dec. 28, 1973, Ser. No. 429,348

Int. Cl.² G02B *15/18*

U.S. Cl. 350—187 **16 Claims**



1. A variable focal length lens of the type including a front focusing lens group and first and second axially movable lens groups for varying the equivalent focal length of the lens, comprising an elongated cylindrical member, a sleeve-like operating member disposed about said cylindrical member adapted to move axially with respect to said cylindrical member for varying the focal length and rotatably with respect thereto for focusing, focusing means threadably mounting said front group to said cylindrical member for focusing movement, means connecting said focusing means to said operating member so that rotation of said operating member produces rotation of said focusing means on said mounting, said connecting means permitting axial movement of said operating member with respect to said cylindrical member without rotation of

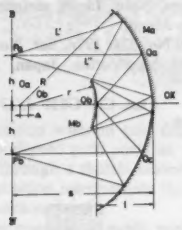
said focusing means, first and second guide slots defined in said cylindrical member, each having axial and tangential directional components, a first mounting member for said first lens group in said cylindrical member and having a first pin extending therefrom through said first guide slot, an axial slot defined in said first mounting member, a mounting member for said second lens group within said first mounting member, a second pin extending from said second mounting member through said axial slot into said second guide slot, and an annular channel defined in said operating member and receiving said first pin therein.

4,097,125

IMAGE FORMING OPTICAL SYSTEM

Akiyoshi Suzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1976, Ser. No. 701,946
Claims priority, application Japan, Jul. 2, 1975, 50-82115
Int. Cl.[2] G02B 5/10
U.S. Cl. 350—294 6 Claims



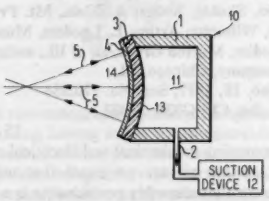
1. An image forming optical system comprising;
(a) a concave mirror;
(b) a convex mirror having a smaller radius of curvature than that of said concave mirror and arranged in face-to-face relation with said concave mirror at a location such that the center of curvature of said convex mirror is spaced from that of said concave mirror toward said concave mirror, and
(c) said concave mirror comprising means for reflecting radiation incident on said optical system to said convex mirror and for reflecting said radiation from said convex mirror out of said optical system in a direction generally opposite that of said radiation incident on said optical system.

4,097,126

OPTICAL LAYER DEVICE WITH REFLECTING SURFACE ON COLLODION FOIL

Hans Mahlein, and Walter Rauscher, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 25, 1976, Ser. No. 689,924
Claims priority, application Germany, Jun. 10, 1975, 2525863
Int. Cl.[2] G02B 5/10, 1/10
U.S. Cl. 350—295 1 Claim



1. An optical layer device for use as a mirror in a tunable laser comprising a holder, a substrate of an elastic deformable material having a surface of a predetermined curvature in an undeformed condition, said substrate being a collodion foil having a thickness in the range of between 0.05 and 0.2 mm, said surface being provided with a reflecting surface layer comprising at least one layer of material selected from a group consisting of dielectric and metallic materials, said substrate having a periphery sealed to said holder to mount the substrate thereon, and means for selectively deforming the substrate to change the predetermined curvature of said surface in a predetermined spherical or aspherical fashion so that the optical layer device functions as a variable reflector.

4,097,127

MIXED LIQUID CRYSTALLINE TEXTURE FORMATION

Werner E. L. Haas, Webster, and Gary A. Dir, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 2, 1977, Ser. No. 773,448
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—332 6 Claims

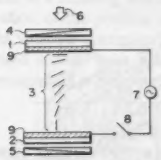
1. A method of forming a mixture of the Grandjean and focal-conic textures of the cholesteric mesophase, comprising:
(a) providing a liquid crystalline material in a texture selected from the group consisting of the Grandjean texture and the focal-conic texture of the cholesteric mesophase;
(b) applying an electrical field across said liquid crystalline material within the cholesteric-to-nematic electrical field range of said liquid crystalline material thereby transforming said liquid crystalline material from the cholesteric mesophase to the nematic mesophase; and
(c) decreasing the magnitude of said applied electrical field over a period of time effective to transform said liquid crystalline material from the nematic mesophase to said mixture of the Grandjean and focal-conic textures of the cholesteric mesophase.

4,097,128

LIQUID CRYSTAL COLOR DISPLAY DEVICES

Shoichi Matsumoto, Yokohama; Masahiro Kawamoto, Kamakura, and Kiyoshi Mizunoya, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 20, 1976, Ser. No. 678,553
Claims priority, application Japan, Apr. 24, 1975, 50-49155; Oct. 9, 1975, 50-121269; Oct. 9, 1975, 50-121270; Oct. 9, 1975, 50-121271; Oct. 9, 1975, 50-121272
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—335 16 Claims



1. A liquid crystal color display device which comprises at least one liquid crystal cell formed of first and second substrates, at least one of which is transparent and both of which are coated with first and second electrodes, at least one of which is transparent and an nematic liquid crystal interposed between the first and second substrates, the surface of the first substrate being so treated as to cause the molecules of the nematic liquid crystal to be orientated parallel with the substrate surface and the surface of the second substrate being so treated as to cause the molecules of the nematic liquid crystal to be orientated perpendicular to the substrate surface; at least

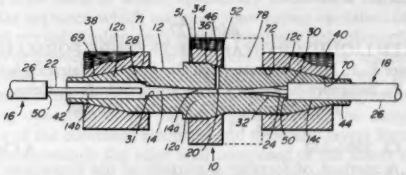
one polarizer; and means for varying the birefringence of the nematic liquid crystal.

4,097,129

COUPLING DEVICE FOR PROTECTIVELY JACKETED FIBERS

Charles K. Wellington, Westford, and Mark L. Dakss, Waltham, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 25, 1976, Ser. No. 689,753
Int. Cl.[2] G02B 5/16
U.S. Cl. 350—96.15 **18 Claims**



1. A device for coupling a pair of protectively jacketed optical fibers in axial alignment comprising:

a resiliently compressible body for holding a pair of opposing fibers in end-to-end abutment in an abutment region, the body receiving the fiber pair through opposite ends of a fiber-receiving bore formed axially therethrough, the bore having an oversized cross-section with respect to the cross-sections of the received fibers, wherein the bore includes an inner portion for receiving bared ends of the fiber pair and a pair of outer portions for receiving the jacketed portion of the fibers; and

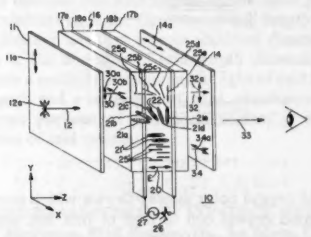
body compression means for forming a plurality of fiber-engaging areas along the bore wall in the abutment region to exert a lateral aligning force on the abuttingly held fiber tips, and wherein the body compression means includes first means for symmetrically reducing the cross-section of the inner bore portion to a fiber-engaging dimension and second means for reducing the cross-section of the outer bore portions to a jacket-engaging dimension.

4,097,130

MULTI-COLORED LIQUID CRYSTAL DISPLAYS

Herbert S. Cole, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,603
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—335 **16 Claims**



1. A transmissive display for selectively imparting one of a plurality of colors to visible light transmitted in a first direction therethrough, comprising:

a first polarization member having an axis of polarization positioned in a second direction substantially perpendicular to said first direction; a second polarization member having an axis of polarization positioned in a third direction substantially perpendicular to both said first and second directions, said second polarization member absorbing light in a region about a first wavelength in the visible spectrum when the light is polarized with its electric field vecto parallel to the axis of polarization of said second polarization member;

a liquid crystal cell positioned between said first and second polarization members and along the optical path in said first direction therebetween, said cell being actuable between first and second conditions of molecular orientation; and

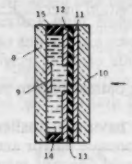
means contained within said cell for absorbing visible light in a region about a second wavelength different from said first wavelength, only when said cell is actuated to said first condition of molecular orientation; said means allowing transmission of light through said cell substantially without absorption when said cell is actuated to said second condition.

4,097,131

REFLECTIVE TYPE LIQUID CRYSTAL DISPLAY

Mitsuru Nishiyama, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 24, 1976, Ser. No. 744,775
Claims priority, application Japan, Nov. 28, 1975, 50-163399[U]
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—338 **4 Claims**



1. A reflective type liquid crystal display comprising:

first and second support plates;

a segmented reflective electrode deposited on said first support plate;

a transparent electrode deposited on said second support plate;

a reflective coating deposited on said second support plate in a region except the region corresponding to said reflective electrode;

an intermediate layer of insulator material interposed between said transparent electrode and said reflective coating, said intermediate layer being capable of preventing a chemical reaction about the interface between said transparent electrode and said reflective coating; and

a liquid crystal composition sandwiched between said first and said second support plates.

4,097,132

PROJECTOR MOLDED CHASSIS

Raymond W. H. Kim, Skokie; Robert A. Klein, Mt. Prospect; Edward H. Lodge, Wilmette; Arthur L. Lueders, Mundelein, and James G. Woodier, Morton Grove, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 18, 1977, Ser. No. 770,254
Int. Cl.[2] G03B 17/02
U.S. Cl. 352—242 **15 Claims**

1. A housing for mounting mechanical and electrical components to provide a motion picture projector that utilizes a manually shiftable controller assembly positionable in a plurality of positions for selecting operational modes, the housing comprising a unitary molded structure including:

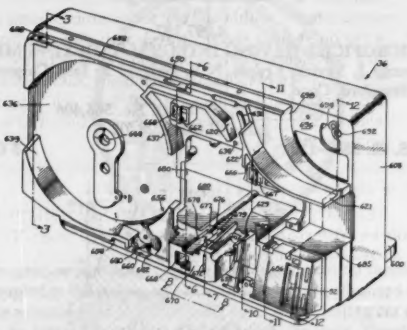
a generally rectangular base;

an upstanding edgewall extending from said base and defining a mounting body having front and rear surfaces:

a strengthening flange substantially circumscribing said upstanding edgewall;

a lip disposed around at least portions of the perimeter of said strengthening flange for interfitting with a rear housing cover;

means for defining a film path on said front surface of said edgewall between a supply assembly position and a take-



up assembly position wherein said film path includes a plurality of non-aligned path portions, said film path arranged to pass through a shuttle assembly position and a gate assembly position intermediate the take-up and supply assembly positions; and

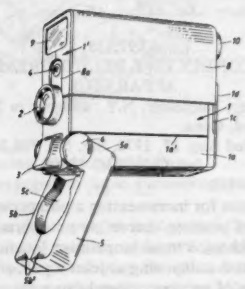
means for defining operational mode positions of the controller assembly, said operational mode position defining means comprising detent positions defined at the upper and lower extremities of an H-shaped pattern and at the extremes of the center cross-bar of the H-shaped pattern.

4,097,133

CINEMATOGRAPHIC CAMERA

Otto Stemme, Munich; Peter Lermann, Narring, and Gabriele Ehgartner, Pullach, all of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Germany

Filed Feb. 28, 1977, Ser. No. 772,970
Claims priority, application Germany, Mar. 12, 1976, 2610515
Int. Cl.[2] G03B *17/00*
U.S. Cl. 352—243 **19 Claims**



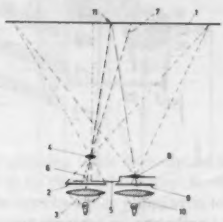
1. A cinematographic camera, comprising a collapsible camera housing having a first section provided with a viewfinder and a second section provided with a photographic lens, one of said sections being a movable section mounted for telescoping displacement relative to the other section between a retracted and an extended position in which said viewfinder is respectively blocked and unblocked by said second section; a movable third section forming a handgrip mounted on said camera housing for displacement between a retracted and an extended position in which it respectively hugs and projects outwardly from said camera housing; and means responsive to displacement of one of said movable sections from the retracted position thereof by releasing the other movable section for displacement to its extended position.

4,097,134

PROJECTION DEVICE

Hans G. Jerie, 15, Demmerskamp, Lonneker, Netherlands

Filed Feb. 24, 1976, Ser. No. 661,003
Int. Cl.[2] G03B *21/00, 21/20, 21/26, 21/14*
U.S. Cl. 353—11 **8 Claims**



1. A projection device comprising:

a projection screen presenting a surface defining an image projection area;

means defining a first area to be occupied by a first diapositive carrying a pictorial representation of a given subject;

a first optical system arranged to project an image of the entirety of the first area onto said screen in a manner such that the image fills substantially the entire image projection area;

means defining a second area to be occupied by a second diapositive carrying a pictorial representation of the same subject, and to the same scale, as the first diapositive;

a second optical system producing a greater magnification than said first optical system and arranged to project an image of a portion constituting a fractional part of the second area onto said screen in a manner such that the image of such portion fills substantially the entire image projection area; and

a transparent runner movable parallel to the first and second areas and provided with a window located adjacent the first area and corresponding in size to a portion of the first area, said runner carrying at least part of said second optical system at a location relative to said window such that the location of the portion of the first area which is adjacent said window corresponds to the location of the portion of said second area which said second optical system is arranged to project on said screen.

4,097,135

APPARATUS FOR AUDIO VISUAL PRESENTATION OF MUSIC

Richard R. Castor, 164 Roselawn Cres., Fairport, N.Y. 14450

Filed Jan. 12, 1977, Ser. No. 758,593
Int. Cl.[2] G03B *31/04;* G09B *15/02*
U.S. Cl. 353—15 **5 Claims**

1. Apparatus for audio-visual presentation of music comprising in combination:

a. a projection screen having indicia thereon representative of a note play marker;

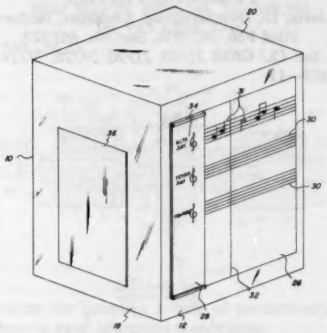
b. a film strip having recorded thereon a musical composition having measures of equal length and notes which are spaced within said measures according to their beat value;

c. a projector having an advance mechanism for successively projecting on said projection screen a plurality of

visual images of the musical composition recorded on the filmstrip;

d. a tape recorder;

e. a two channel tape operatively carried by said recorder and including a first channel having a programmed master signal recorded thereon and a second channel having a plurality of synchronizing signals recorded thereon at predetermined intervals which are representative of a desired musical tempo, said tape recorder being constructed and arranged to produce a first output in accordance with said programmed master signal and a second output in accordance with said synchronizing signals;



f. an audio-speaker having its input connected to said first output of said recorder; and

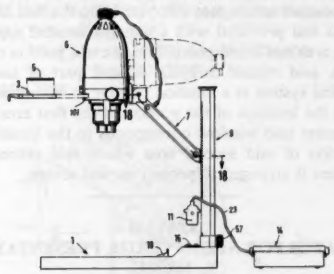
g. control means having its input connected to said second output of said recorder and its output connected to said advance mechanism to cause said projector to display successive visual images of said composition in accordance with said synchronizing signals.

4,097,136

PROJECTOR FOR VISUAL IMAGES

Jose Manuel Alonso Astarloa, Bilbao, Spain, assignor to Iberastron, S.L., Bilbao, Spain

Filed Oct. 21, 1976, Ser. No. 734,697
Int. Cl.² G03B *21/22, 27/52;* H01R *9/00*
U.S. Cl. 353—71 **4 Claims**



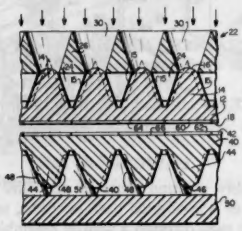
1. A projector for visual images comprising a base, a column connected to said base, an adjustable arm positionable along said column and a projector body carried by said arm, said column having the general configuration of a channel, with the legs of said channel being resiliently spreadable, the end of said arm joining with said column including connection means for engagement within the channel of said column, said connection means being positionable within said column upon rotation of said connection means 90°, said connection means being rotatable after insertion 90° to return to its original position, said resiliency of said legs serving at least in part to locate said arm, a first annular member extending upwardly from said base and a second annular member surrounding said first annular member and defining a space between said first and second annular members, said column being insertable in said space for supporting said column on said base, clamping means acting between said annular members and said column for securing said column with respect to said base, conductor means mounted internally of said first annular member, and said column including conductive plates engaged with said conductor means when said column is mounted to said base.

4,097,137

MICROFICHE HAVING INTEGRAL INDEXING MEANS

George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

Filed Apr. 9, 1975, Ser. No. 566,406
Int. Cl.² G03B *23/08*
U.S. Cl. 353—120 **3 Claims**



1. A microfiche assembly, including a microfiche defined by a transparent sheet adapted to carry stored micro optical information over its area, one surface of said sheet including a plurality of lenses, the improvement comprising an alignment member having optical apertures therethrough and also carrying regularly arranged downwardly extending positioning nodules having valleys therebetween, the microfiche carrying a plurality of regularly arrayed upstanding positioning nodules positioned in the valleys between the said complementary regularly arrayed downwardly extending positioning nodules integral with said alignment member, the tips of said upstanding nodules defining said lenses, at least some of said lenses being optically aligned with the optical apertures of the alignment member, said optical apertures located in said valleys of said downwardly extending nodules whereby the two sets of positioning nodules align the microfiche with respect to the alignment member.

4,097,138

PHOTOCONDUCTIVE BELT INCREMENTING APPARATUS

William Kingsley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 27, 1976, Ser. No. 718,247
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 DR **5 Claims**

1. An apparatus for incrementing a photoconductive belt to advance unused portions thereof to an operative location as used portions advance to an inoperative location, including:

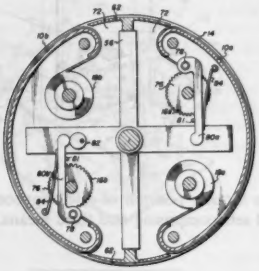
a support frame comprising at least a pair of segments;

at least a pair of supply stations having the unused portions of the photoconductive belt stored therein, each of said supply stations being associated with one of the segments of said support frame;

at least a pair of receiving stations having the used portions of the photoconductive belt stored therein, each of said receiving stations being associated with one of the segments of said support frame; and

means for advancing automatically incremental portions of the photoconductive belt from each of the supply stations

to each of the receiving stations with one surface of the photoconductive belt being in contact with the exterior portion of each segment of said support frame during movement thereof from said supply station to said receiving stations, said advancing means comprising a gear connected to said receiving station, a pinion meshing with



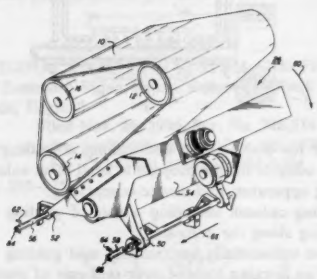
the gear, an actuating bar having one end portion thereof coupled to the pinion, and a cam engaging the other end of the actuating bar to periodically pivot the actuating bar so as to rotate the pinion meshing with the gear, thereby advancing an incremental portion of the photoconductive belt from the supply station to the receiving station.

4,097,139

REPRODUCING MACHINE HAVING INTERCHANGEABLE DEVELOPER HOUSINGS

Oscar G. Hauser, Rochester; Thomas Meagher, and Frederick R. Ruckdeschel, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 30, 1976, Ser. No. 728,102
Int. Cl.² G03G *15/01*
U.S. Cl. 355—4 **23 Claims**



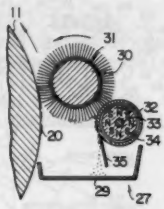
1. A reproducing machine, including:
a member arranged to have successive latent images recorded thereon,
first means for developing at least one of the latent images recorded on said member with particles of a first color;
second means for developing the other latent images recorded on said member with particles of a second color;
first means for moving said first developing means from an operative position in communication with the latent images to an inoperative position external to the reproducing machine; and
second means for moving said second developing means from the inoperative position external to the reproducing machine to the operative position in communication with the latent images after said first moving means moves said first developing means to the inoperative position.

4,097,140

METHOD AND APPARATUS FOR CLEANING TONER IN ELECTROPHOTOGRAPHIC COPYING MACHINES

Kohji Suzuki, Kawasaki, and Kazuaki Tagawa, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 22, 1976, Ser. No. 707,615
Claims priority, application Japan, Jul. 22, 1975, 50-89501
Int. Cl.² G03G *21/00*
U.S. Cl. 355—15 **8 Claims**



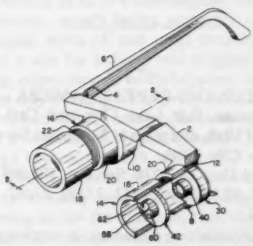
1. A method of cleaning toner from the surface of a photosensitive member in an electrophotographic copying machine of the dry, transfer type in which a magnetic toner is used as a developer, comprising the steps of: providing a rotatable cylindrical brush adjacent the surface of said photosensitive member to remove magnetic toner attached to the surface of the photosensitive member and transfer it to said brush by a mechanical rubbing action; transferring magnetic toner which attaches to the cylindrical brush onto a non-magnetic sleeve located adjacent the cylindrical brush and internally housing a magnet; providing relative rotation between the magnet and the sleeve; and scraping off any magnetic toner which attaches to the sleeve by a separator which is located adjacent the surface of the sleeve.

4,097,141

OPTICAL OBJECTIVES USING APERTURED RETRODIRECTIVE REFLECTORS

David A. Warner, 100 Memorial Dr., Cambridge, Mass. 02142

Continuation-in-part of Ser. No. 568,939, Apr. 17, 1975, abandoned. This application Mar. 16, 1977, Ser. No. 778,212
Int. Cl.² G02B *17/00, 23/06*
U.S. Cl. 350—27 **17 Claims**

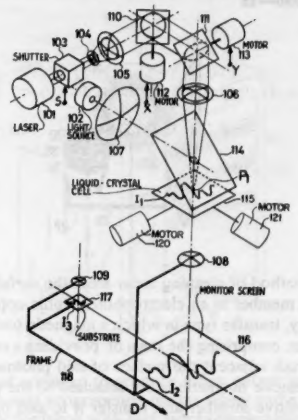


1. An optical system comprising:
a corrected lens mounted coaxially in front of a truncated retrodirective reflector, said lens having a reflective central portion so positioned as to receive light reflected from the truncated retrodirective reflector and redirect the light through the truncated portion of the retrodirective reflector.

4,097,142
OPTICAL PATTERN TRACER

Paul Cyril Moutou; Michel Hareng, and Serge Le Berre, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 14, 1976, Ser. No. 750,456
Claims priority, application France, Dec. 19, 1975, 75 39184
Int. Cl.[2] G03B *29/00, 27/70*
U.S. Cl. 355—45 4 Claims



1. An apparatus for tracing under the control of a set of external control signals a pattern onto a substrate coated with a photo-sensitive product, which comprises:

a liquid crystal cell;

means for recording an enlarged copy of said pattern onto said cell under the control of said external control signals; said recording means comprising a light source for emitting a beam comprising substantially infrared radiations, means for deflecting said beam along two seaprate directions, delivering a deflected beam, means for focusing said deflected beam onto said cell, and means for occulating said beam;

first means for optically projecting said enlarged copy on a reduced scale onto said substrate;

a monitoring screen; and

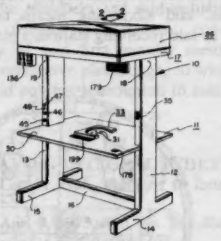
second means for optically projecting said enlarged copy on a far more enlarged scale onto said monitoring screen; said substrate said monitoring screen, and said first and second projecting means being secured to a frame movable between a monitoring position and a tracing position.

4,097,143
STEP-AND-REPEAT CAMERA

Vernon G. Buchanan, Salt Lake City, and Carl E. Rhoades, Lindon, both of Utah, assignors to Microfilm Service Corporation, Salt Lake City, Utah

Filed Dec. 13, 1976, Ser. No. 750,007
Int. Cl.[2] G03B *27/42, 27/60, 27/62*
U.S. Cl. 355—53 5 Claims

1. Photographic structure including, in combination, a table, camera structure spacedly disposed above said table, and a copyboard lock-positioned in a first discrete position on said table in registry with said camera structure and provided with fixed means for enabling upward translational movement of, horizontal 90° rotational displacement of, and downward return of said copyboard to a second, locked, discrete position of said copyboard relative to said table, one of said table and said copyboard having a set of plural protrusions adjacent ones of which are equally spaced, the remainder of said table and copyboard having a set of holes equal in number with and identical in pattern to and positioned to receive all of said

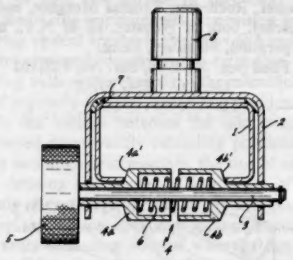


protrusions for any position of said copyboard on said table, one of said sets comprising said fixed means.

4,097,144
ADJUSTMENT DEVICE FOR PHOTOGRAPHIC ENLARGING OR REPRODUCING APPARATUS

Claus Prochnow, Brunswick, Germany, assignor to Rollei-Werke Franke & Heidecke, Brunswick, Germany

Filed Nov. 17, 1976, Ser. No. 742,710
Claims priority, application Germany, Nov. 28, 1975, 2553556
Int. Cl.[2] G03B *27/52;* A47G *29/00*
U.S. Cl. 355—63 12 Claims



1. Device for displacing a body along a guiding column particularly suitable for the projection head of an enlarging or reproducing apparatus, said device comprising:

a. a guiding column including a pair of guiding surfaces extending along the column;

b. a sleeve substantially surrounding said guiding column, having an opening located over said pair of guiding surfaces;

c. a shaft mounted on said sleeve across said opening with its axis of rotation extending tangent to said guiding column in a plane perpendicular to the direction of extension of said guiding column;

d. a pair of friction wheels disposed on said shaft, at least one thereof being axially moveable on the shaft and extending through the opening in said sleeve to roll along said guiding column, each wheel having a lateral surface normally respectively held in rolling contact with a guiding surface of said pair; said guiding surface and said lateral surface forming an acute angle with each other; and,

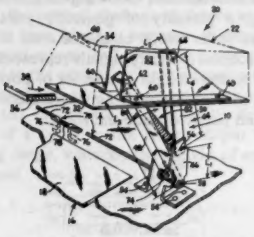
e. means for exerting axial forces on said wheels of the pair to force their lateral surfaces against the guiding surfaces of said guiding column, whereby said shaft is wedged outwardly from said column pulling said sleeve more tightly around said column.

4,097,145

MEANS FOR SELF-POSITIONING PLATEN COVERS

Harry E. Luperti, Wilton, and Robert E. Manna, Newtown, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 3, 1977, Ser. No. 756,348
Int. Cl.[2] G03B 27/62
U.S. Cl. 355—75 12 Claims



1. In a copier including framework and a platen on which respective documents of different thickness may be placed for copying purposes, and means for covering said platen, self-positioning apparatus comprising:

a. linkage means for movably supporting said covering means, said linkage means adapted to permit movement of said covering means between a predetermined position adjacent to said platen for holding respective documents of minimal thickness in contact with said platen and various positions away from said platen for holding respective documents of greater thickness in contact with said platen;

b. resilient means for urging said covering means away from said platen, said resilient means including torsion bar means biased to urge said covering means away from said platen, said resilient means including coil spring means cooperative with said linkage means and said torsion bar means for balancing said covering means at respective levels of elevation with respect to said platen; and

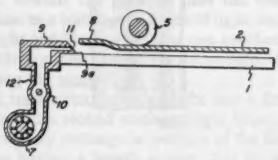
c. latching means for releasably holding said covering means in said predetermined position.

4,097,146

ORIGINAL HANDLING SYSTEM AND PROCESS

Yusuke Sasamori, Ebina, Japan, assignor to Rank Xerox, Ltd., London, England

Filed Nov. 26, 1976, Ser. No. 745,516
Claims priority, application Japan, Dec. 18, 1975, 50-170021
Int. Cl.[2] G03B 27/62; B65H 9/04
U.S. Cl. 355—75 5 Claims



1. In a reproducing apparatus comprising:

means for discharging an original from an exposure station after exposure; said exposure station comprising: an exposure platen; fixed stop means having a stop surface for engaging an edge of said original for determining the position of said original on said exposure platen; and means for projecting an image of said original at said platen onto a photosensitive body; said discharging means including means for feeding said original in a desired direction off said platen and over said fixed stop means; the improvement, wherein, said apparatus further includes:

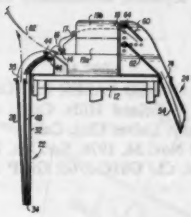
means for flowing air against said edge of said original and across said platen in a direction opposed to said desired direction in which said original is fed off said platen, said means for flowing air forming an air layer between said exposure platen and said original for lifting said edge of said original so that it can be discharged over said fixed stop means.

4,097,147

PRINT MACHINE FRAME

J. Milton Portewig, 405 E. Laburnum Ave., Richmond, Va. 23222

Filed Jun. 1, 1977, Ser. No. 802,392
Int. Cl.[2] G03B 27/30, 27/02
U.S. Cl. 355—106 7 Claims



1. A tray assembly to be used with a print machine, of a type having an exposure portion, said exposure portion including a first inlet for receiving original traces and print paper sheets and a first outlet for ejecting said original traces and print-paper sheets from said exposure portion, and a developing portion, said developing portion including a second inlet for receiving exposed print paper sheets and a second outlet for ejecting developed print-paper sheets, said tray assembly including:

an originals/print-paper tray; and

a copies tray;

said originals/print-paper tray defining a relatively flat envelope for holding originals to be copied and print paper on which said copies will be printed in a substantially vertical orientation, said envelope having a mouth at one edge thereof through which originals and print paper can be inserted into and removed from said envelope, said originals/print-paper tray including a mounting means for mounting said originals/print-paper tray adjacent to said print machine to have a substantially vertical orientation, said envelope mouth facing upwardly adjacent said first and second inlets of said print machine, said envelope being of a size for holding said originals and print paper with top edges thereof being adjacent said mouth;

said copies tray defining a relatively flat copies envelope for receiving and holding said copies in an orientation tending toward a vertical, said copies envelope having a mouth at one edge thereof through which said copies can be received from said print machine and removed from said copies envelope by an operator, said copies tray including a mounting means for mounting said copies tray adjacent said print machine to have an orientation tending toward the vertical with said copies-envelope mouth facing upwardly adjacent said second outlet.

7. A method of making copies of large sheets with a print machine of the type having an exposure portion, said exposure portion including a first inlet for receiving original traces and print paper sheets and a first outlet for ejecting said original traces and print-paper sheets from said exposure portion, and a developing portion, said developing portion including a second inlet for receiving exposed print paper sheets and a second

outlet for ejecting developed print-paper sheets, said method comprising the steps of:

placing the originals in a substantially vertically-oriented envelope having a mouth opening upwardly adjacent to said inlets of said print machine, said originals facing said print machine;

placing a stack of print paper in said originals/print-paper envelope on the opposite side of said originals from the print machine;

extracting an original to be copied and a sheet of print paper from said originals/print-paper envelope simultaneously and feeding the lower edge of said original and said sheet of print paper together into said first inlet of said print machine;

upon its ejection from said first outlet, guiding said original back into said originals/print-paper envelope; and

upon its ejection from said first outlet, guiding said print paper into said second inlet; and,

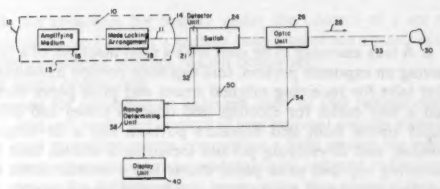
upon its ejection from said second outlet, guiding said print paper into a separate, substantially vertical copies envelope.

4,097,148

MODE LOCKED LASER RANGE FINDER

Stephen M. Fry, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 24, 1976, Ser. No. 744,531
Int. Cl.[2] G01C 3/08; G01P 3/36
U.S. Cl. 356—5 **9 Claims**



1. A laser range finder comprising:

a mode locked laser having a cavity for providing mode locked laser pulses oscillating in said cavity along an optical path;

switching means positioned external to said cavity in said optical path for passing at least one of said laser pulses therethrough;

optical means positioned in said optical path for transmitting at least one of said laser pulses passed through said switching means toward an object, and including first pulse detector means for detecting a pulse returned from said object;

second pulse detector means positioned between said cavity and said switching means for detecting said laser pulses coming from said cavity; and

counting means coupled to said first pulse detector means and said second pulse detector means for providing range counts during a counting interval.

4,097,149

QUANTITATIVE PROTEIN ANALYSIS BY IMMUNODIFFUSION

Frederick J. Aladjem, and Padmasini K. Ayengar, both of Pasadena, Calif.

Filed Feb. 3, 1975, Ser. No. 546,351
Int. Cl.[2] G01N 27/26
U.S. Cl. 356—72 **16 Claims**

1. Method of obtaining a quantitative measurement of the concentration of a protein in an antigen sample which has been subjected to immunoelectrophoresis including the steps of producing selective protein migration by electrophoresis in one dimension in a thin layer of supporting medium, and subjecting the antigen sample after said migration to immunodiffusion with an antibody source containing an antibody specific to said protein, the protein and antibody diffusing into reactive contact in another dimension through an area of said medium layer intially free of both antigen and antibody and reacting to form an elongated precipitation zone; said method comprising

scanning the zone by optical means under dark field illumination, at a selected time following initiation of said diffusion, along a plurality of generally parallel mutually spaced scan paths which cross the zone transversely to develop electrical intensity signals representing the intensity of the scattered light at a series of positions on each scan path, said positions being distributed partly within the zone and partly outside the zone,

deriving from said intensity signals for a plurality of said positions within the zone an electrical sum signal representing the sum of the effective excess of each of the intensities within the zone over intensities outside the zone,

and comparing the resulting sum signal with a set of reference sum signals derived from corresponding measurements of reference zones produced by equivalent immunoelectrophoresis of a plurality of reference antigen solutions containing respective known concentrations of said protein,

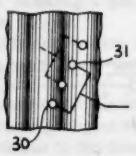
thereby providing a quantitative measure of the concentration of said protein.

4,097,150

OPTICAL DETECTION WEIGHING SYSTEM

Bosco Wu, Trumbull, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jul. 23, 1976, Ser. No. 708,444
Int. Cl.[2] G01B 23/36, 9/02
U.S. Cl. 356—72 **8 Claims**



1. An optical detection weighing system, comprising:

a tare support means for supporting an article to be weighed through a weighing range, said tare support means being substantially rigid so that displacement of the tare support means through the weighing range will not be substantially visually apparent; and

an optical detector for determining the extent of the tare support means displacement, the detector including a first optical grating and a second optical grating, said first optical grating being fixed to the tare support means and being displaceable therewith through said weighing

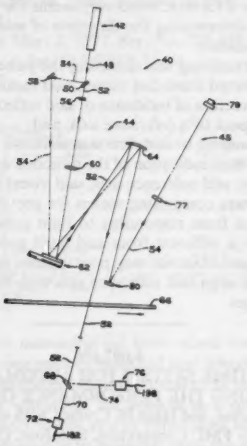
range, said second optical grating being operatively fixed with respect to the displacement of the first optical grating and said tare support means, the optical detector further including a light source means, the optical gratings being positioned with respect to each other and said light source means for modulating light from said light source means to provide an optical interference pattern having at least one moire-type fringe, and photodetector means diposed adjacent the optical gratings to detect an optical shift in one moire-type fringe in response to displacement of the tare support means, and provide an electrical output proportional to the optical shift of said moire-type fringe, said optical gratings and said photodetection means being constructed to operate in a generally linear, repeatable portion of a cyclic moire fringe output throughout the weighing range, whereby the weight of an article may be determined.

4,097,151

METHOD OF AND APPARATUS FOR LOCATING B TYPE AND POINT TYPE DEFECTS IN A GLASS RIBBON

Hugh E. Shaw, Jr., New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 16, 1976, Ser. No. 667,325
Int. Cl.[2] G01N *21/00, 21/16*
U.S. Cl. 356—73 **13 Claims**



1. In a method of inspecting a glass for point type and B type defects wherein the method includes the steps of directing a beam of light toward the glass to pass the beam of light through the glass as a transmitted beam of light; and displacing the beam of light and glass relative to one another to pass the beam of light through the glass along a scan path, the improvement comprising the steps of:

splitting the transmitted beam of light into a first scanning light beam and a second scanning light beam;

passing a generally rectangular portion of the first scanning light beam having a length greater that its width to (1) minimize ratio of light to dark areas of the first scanning light beam caused by point type defects and (2) maximize ratio of light to dark areas of the first scanning light beam caused by B type defects;

sensing intensity variations of the generally rectangular portion of the first scanning light beam to determine B type defects in the glass;

passing a generally rectangular portion of the second scanning light beam having a length less than the length of the rectangular portion of the first scanning light beam to (1) minimize ratio of light to dark areas of the second scanning light beam caused by B type defects and (2) maximize ratio of light to dark areas of the second scanning light beam caused by point type defects; and

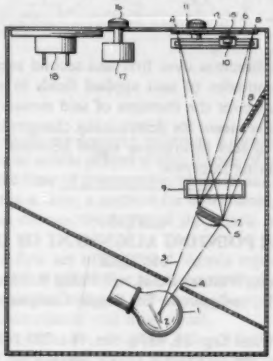
sensing intensity variations of the rectangular portion of the second scanning beam to determine point type defects.

4,097,152

SPECTROPHOTOMETER WITH VISUAL SPECTRUM DISPLAY

Stanley J. Kishner, Pomona, N.Y., assignor to Kollmorgen Corporation, Hartford, Conn.

Filed Aug. 25, 1976, Ser. No. 717,587
Int. Cl.[2] G01J *3/42*
U.S. Cl. 356—96 **1 Claim**



1. A spectrophotometer for providing, simultaneously, a measurement of sample transmittance at any desired visible wavelength and a display of the visible transmittance spectrum of the sample comprising:

(a) an incandescent lamp having a linear filament;

(b) a lens for focusing the light produced by said filament;

(c) a transmissive diffraction grating responsive to said light focused by said lens for dispersing said light into its component wavelengths and illuminating said sample with said dispersed light;

(d) a diffusing viewing screen for displaying the dispersed light transmitted by said sample;

(e) a photoconductive photodetector located proximate to and below said display and slightly closer to said diffraction grating than said screen for simultaneously, selectively sensing a portion of the spectrum of said dispersed light transmitted by said sample and displayed on the upper portion of said screen;

(f) means for indicating which portion of the spectrum of said dispersed light transmitted by said sample is being sensed by said photodetector; and

(g) means for providing a visual indication of the sample transmittance.

4,097,153

METHOD AND APPARATUS FOR MEASURING THE ELECTROPHORETIC MOBILITY OF SUSPENDED PARTICLES

Joseph DeRemigis, New Market, Canada, assignor to Sentrol Systems Ltd., Downsview, Canada

Filed May 17, 1976, Ser. No. 686,835
Int. Cl.[2] G01N *21/00;* G01P *3/36;* B01K *5/00;* G01B *9/02*
U.S. Cl. 356—103 **25 Claims**

1. In an apparatus for measuring the electrophoretic mobility of particles suspended in a fluid medium including a source of coherent electromagnetic radiation, means for directing source radiation upon said suspended particles to produce scattered radiation dependent in frequency on the velocity of said particles in a certain direction, a radiation detector, means for

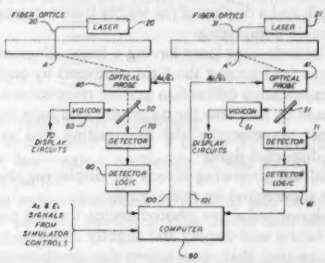
coupling source radiation and scattered radiation to said detector, said detector providing a heterodyne signal, and analyzer means for determining the spectral composition of said heterodyne signal, the improvement comprising means for applying to the suspended particles respective first and second electric

fields in said direction over first and second measuring intervals, the magnitudes of said applied fields in said direction being constant over the duration of said measuring intervals, and comparison means for determining changes in the spectral composition of said heterodyne signal between said first and second measuring intervals.

4,097,154
PRECISE POINTING ALIGNMENT OF OPTICAL PROBES

David L. Peters, Whitney Point, and Philip R. Marr, Sr., Vestal, both of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Sep. 21, 1976, Ser. No. 725,165
Int. Cl.[2] G01B *11/26*; G09B *9/08*
U.S. Cl. 356—152 **17 Claims**



1. In a camera/model display system comprising two model boards, each with its own optical probe and with means to control the positioning of said optical probes, apparatus to enhance the positioning of said probes to allow each to precisely view desired points on their respective model boards with the same perspective comprising:

a. a laser having a characteristic light signature distinguishable from that of the lighting used to illuminate said model boards;

b. means to communicate said laser light to a desired point on each model board from which point said light is emitted;

c. means to distinguish said laser light from the light output of each optical probe as said probes view their respective model boards;

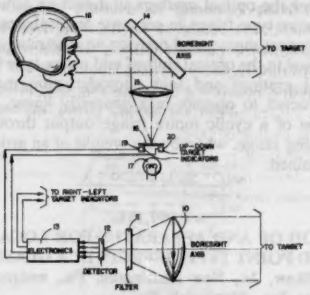
d. means to locate the relative positions of said laser light within the field of view of each of said optical probes; and

e. means to correlate said locations and to generate a differential control signal to apply to at least one of said optical probes, said differential control signal enhancing the operation of said means of controlling the position of said probes and being operative only when there is a difference in the relative positions of said laser light within the field of view of each of said optical probes.

4,097,155
TARGET LOCATING SYSTEM

Quentin D. Appert, Tustin, Calif., assignor to Rockwell International Corporation, Anaheim, Calif.

Filed Jul. 24, 1967, Ser. No. 656,987
Int. Cl.[2] G01B *11/26*; G02B *23/10*
U.S. Cl. 356—152 **9 Claims**



1. In a target locating system wherein a target is illuminated by a pulsed laser illuminator, operating at a preselected fixed pulse rate, by a forward observer, means for use by a remote observer for determining the direction of said target comprising, in combination:

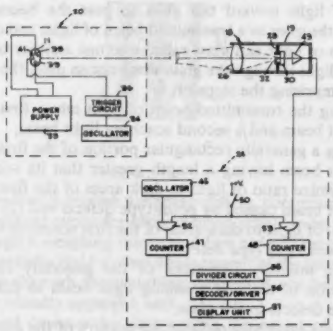
means for receiving and detecting the pulsed laser illumination reflected from that target, said means being sensitive to the direction of incidence of said reflection illumination with respect to a reference axis; and

means responsive to said direction sensitive means for generating a visual indication of the direction of said target with respect to said reference axis, said visual indication generating means comprising means for preventing said visual indication from responding to light pulses whose repetition rate is different from said fixed pulse rate, whereby said remote observer may position said direction sensitive means to align said reference axis with the line of sight to said target.

4,097,156
REAL-TIME SYSTEM FOR AUTOMATICALLY MEASURING THE PERFORMANCE OF WEAPONS

Arnold L. Garber, and Hans H. Cremer, both of San Jose, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Feb. 11, 1977, Ser. No. 767,729
Int. Cl.[2] G01B *11/26*; F41F *27/00*
U.S. Cl. 356—152 **10 Claims**



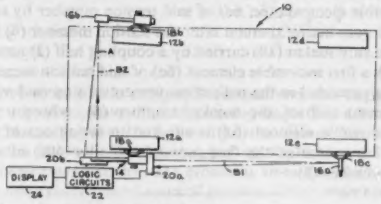
6. A real-time system for automatically evaluating the performance of a weapon by measuring the percentage of time that the weapon is trained on a target, said system comprising:

a flash lamp mounted on said target;
means for energizing said lamp so that said lamp flashes at a predetermined rate;
photodetector means mounted at said weapon;
means for directing flashes of radiant energy from said flash lamp to said photodetector means when and only when said weapon is aimed at said target, said photodetector means having means for developing a signal pulse for each of said flashes of energy received;
signal generating means positioned at said weapon for developing oscillator pulses having a frequency substantially equal to the frequency of said lamp flashes;
first counting means for counting the number of oscillator pulses generated during the time period that said weapon is being evaluated; and
second counting means for counting the number of signal pulses developed by said photodetector means during said evaluation time period.

4,097,157
VEHICLE WHEEL ALIGNER FOR MEASURING FRONT WHEEL TOE WITH RESPECT TO THE REAR WHEEL AXIS OF ROTATION

Melvin H. Lill, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Mar. 2, 1977, Ser. No. 773,639
Int. Cl.[2] G01B *11/26*
U.S. Cl. 356—152 **6 Claims**

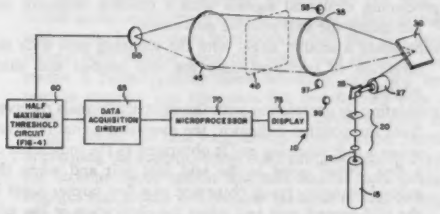


1. Apparatus for measuring the front wheel toe angles of a motor vehicle having pairs of front and rear wheels, said apparatus comprising alignment means adapted to be mounted upon one of said front wheels of the vehicle in a predetermined position with respect to the axis of rotation of said one front wheel, a mirror adapted to be mounted upon the rear wheel of said vehicle on the same side of the vehicle as said one front wheel, said mirror being mounted in a predetermined position with respect to the axis of rotation of said rear wheel, said alignment means including means for projecting a beam of light to said mirror, said alignment means further including means for receiving the reflected beam of light from said mirror and for calculating the toe angle of said one front wheel relative to said axis of rotation of said rear wheel in accordance with the position of the received light beam, means mounted upon one of the front wheels of the vehicle for projecting a beam across the front of the vehicle toward the other front wheel of said vehicle, means mounted upon said other front wheel of said vehicle for projecting a beam across the vehicle toward said one front wheel, means responsive to the positions of said projected beams for providing a signal proportional to the total toe angle between said two front wheels of the vehicle, means connected to said last named means for calculating the total toe angle between said two front wheels of the vehicle, and logic means connected to both of said calculating means for subtracting the toe angle of said one front wheel from the total toe angle and for providing an output reading of the toe angle of the other of said front wheels with respect to said axis of rotation of said rear wheel.

4,097,158
HALF-MAXIMUM THRESHOLD CIRCUIT FOR OPTICAL MICROMETER

Jack T. Dehait, Dayton, Ohio, assignor to Systems Research Laboratories, Inc., Dayton, Ohio

Filed Jan. 6, 1977, Ser. No. 757,218
Int. Cl.[2] G01B *11/08*
U.S. Cl. 356—160 **10 Claims**

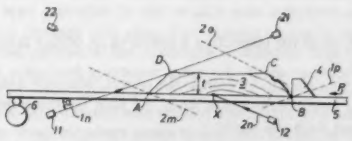


1. In an optical micrometer wherein a beam of light is scanned across an article placed within a zone of measurement and wherein the time of interruption of the beam is a function of the size of the article, a method for determining accurately when the beam crosses the edges of the article including the steps of
generating a first set of electrical signals representing the intensity of the beam after it passes through the zone of measurement including a full-amplitude real time signal and a half-amplitude real time signal,
generating a second set of signals delayed in time from the first set of signals including a full-amplitude delayed signal and a half-amplitude delayed signal,
sensing when the beam is obscured by the article by comparing said full-amplitude real time signal and said half-amplitude delayed signal to produce a first output signal,
sensing when the beam emerges from the outer edge of the article by comparing said half-amplitude real time signal and said full-amplitude delayed signal to produce a second output signal,
delaying the first output signal by the amount of the time delay, and
combining the delayed first output signal and the second output signal to provide a composite output signal which represents the size of the article within the zone of measurement.

4,097,159
METHOD OF, AND DEVICE FOR EFFECTING CONTACT-FREE MEASUREMENT BY OPTICAL SCANNING

Per Strandberg, Vesteras, Sweden, assignor to Kockums Automation AB, Vesteras, Sweden

Filed Aug. 6, 1976, Ser. No. 712,179
Claims priority, application Sweden, Oct. 15, 1975, 7511507
Int. Cl.[2] G01B *11/04*
U.S. Cl. 356—167 **22 Claims**



1. A method of optically scanning an object which in its cross-section shows a first edge limited by a first pair of corner points, and a second edge and a third edge issuing from the first and second corner points of the first pair respectively and terminating by a first and a second corner points of a second

pair respectively, comprising the steps of: moving in a direction at least approximately parallel with the said first edge the object relative a scanning-and-sensing-system comprising at least two emitters emitting scanning rays and at least two scanning ray receivers;

aligning the scanning ray receivers with the scanning rays for producing electrical signals whenever the respective scanning ray is obturated and whenever the obturation subsequently is relieved;

producing electrical signals with a position indicator for indicating the said relative movement;

subtending a smaller angle with the scanning rays with the direction of transport than the said second and third edges;

evaluating, in correlation with the electrical signals received from the position indicator, the electrical signal received when a first scanning ray is obturated as the indication of a first corner point in the said first pair and when the second scanning ray is obturated as a first corner point in the said second pair and when the obturation of the said first scanning ray is relieved as the second corner point in the said second pair and when the obturation of the said second scanning ray is relieved as the second corner point in the said first pair.

4,097,160

METHOD FOR INSPECTING OBJECT DEFECTION BY LIGHT BEAM

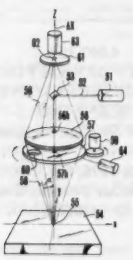
Masamichi Yataki, Tama; Hideyo Takahata, Yokohama, and Norio Simomura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 609,945, Sep. 3, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,328

Claims priority, application Japan, Oct. 7, 1974, 49-115323; Oct. 2, 1974, 49-113610; Sep. 6, 1974, 49-1102679

Int. Cl.² G01N *21/32, 21/48*

U.S. Cl. 356—237 **1 Claim**



1. A method for inspecting a defect of an object comprising the steps of:

projecting a narrow beam to the object, whereby a scattered light beam takes place from the spot on the object projected with the beam;

scanning this scattered light beam for inspection along a certain predetermined circular line to obtain a serial DC output signal when a defect does not exist at the scanned spot and to obtain a serial AC output signal when a defect exists at the scanned spot; and

detecting whether there exists a defect or not by determining whether the output signal is DC or AC.

4,097,161

COUPLING WITH OVERLOAD SAFETY DEVICE

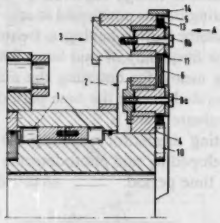
Hermann Weiss, Kaarst, and Hans Wellkamp, Wittlaer, both of Germany, assignors to Atec-Weiss KG, Kaarst, Germany

Filed Jun. 16, 1977, Ser. No. 807,339

Claims priority, application Germany, Sep. 11, 1976, 2640989

Int. Cl.² F16D *9/00*

U.S. Cl. 403—2 **7 Claims**



1. A coupling apparatus employing two coaxially held coupling halves connected to one another by a tension member having a predetermined breaking point, said tension member secured to one coupling half at one end and is radially and tangentially displaced to the other end of the tension member which is secured to the other coupling half, said apparatus including: a movable element (*6c, 6d*) of said tension member positioned at both sides of a predetermined breaking point (*7*) of said tension member, holding means (*9a, 9b,* 11) disposed in proximity to said tension member which limit the swinging of the movable elements (*6c, 6d*) of said tension member by centrifugal forces acting thereon after the tension member (6) has broken; a stop means (10) carried by a coupling half (2) associated with a first moveable element (6c) of said tension member (6), being provided in the path of movement of a second movable element (*6d*) of the tension member (6), whereby the second movable element (*6d*) is adapted to swing out of the path of movement of the first movable element (6c) of said tension member (6).

4,097,162

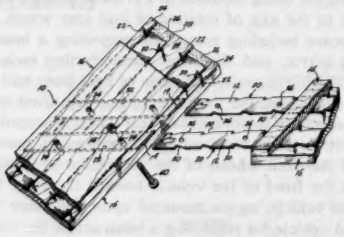
MORTISE AND TENON JOINT

Sir Walter Lindal, Suite 1201, 1120-8th Ave., Seattle, Wash. 98101

Filed Jul. 26, 1976, Ser. No. 708,409

Int. Cl.² B25G *3/00*

U.S. Cl. 403—264 **28 Claims**



1. A construction member comprising a pair of mutually opposing, normally strip-like bodies of wood or other fastener impalable material, which are abutted face to face with one another along a common axis to form the main body of the member, and define an elongated, axially extending slot at the interface therebetween which extends substantially full length of the member and opens at corresponding axial ends of the bodies of fastener impalable material, said slot having defining surfaces thereof which are mutually opposed to one another on

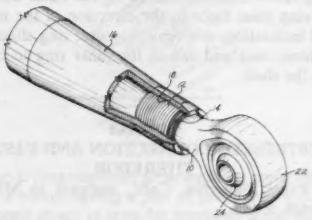
the bodies across the interface, and there being an elongated strip of metal-like reinforcing material interposed in the slot face to face with said surfaces and extending lengthwise of the slot substantially the full length thereof, said metal-like strip having integral tooth-like fasteners on the longitudinally extending edges thereof which are impaled in the bodies of fastener impalable material at the aforesaid surfaces of the slot to rigidly interconnect the bodies across the interface, said bodies of fastener impalable material substantially co-terminating with one another at the aforesaid axial ends thereof, and a portion of said metal-like strip projecting from the slot beyond said axial ends of the bodies of fastener impalable material to form a tenon on that end of the member.

4,097,163

METHOD OF SWAGE JOINING A ROD END TO A TUBE AND THE PRODUCT THEREOF

Douglas K. Dubuque, Lynnwood, Wash., assignor to Tyee Aircraft, Inc., Everett, Wash.

Filed Jan. 10, 1977, Ser. No. 757,950
Int. Cl.² F16B *29/00*
U.S. Cl. 403—274 **1 Claim**



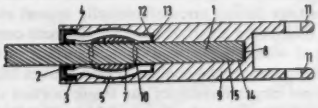
1. A combination swage-joined steel rod end having external, imprinted, screw threads, having major and minor diameters, extending from a free end portion toward an inner end portion thereof and terminating in a plurality of parallel grooves extending into and crosswise of said screw threads to provide axially spaced rows of grooves which rows are normal to the axis of said steel rod, having a depth not greater than the minor diameter of said screw threads, and positioned in the rod adjacent the said inner end portion of said rod; and a relatively softer metallic tube threadedly connected to said rod end and swaged to the rod end by the flow of metal from said tube to said rod end at the area of said grooves in said screw threads.

4,097,164

TERMINALS ON WIRE ROPE AND STRAND

Robert Edward Campbell, Doncaster, England, assignor to Bridon Limited, England

Continuation of Ser. No. 499,652, Aug. 22, 1974, abandoned.
This application Jul. 12, 1976, Ser. No. 704,298
Claims priority, application United Kingdom, Aug. 28, 1973, 40491/73
Int. Cl.² F16G *11/02*
U.S. Cl. 403—284 **4 Claims**



1. A terminal assembly for underformed wire rope or strand, including in combination:

elongated terminal body means having an open end and a first longitudinal bore portion therein extending substantially intermediate the length of said terminal body means, said first bore portion being adapted to receive and engage the rope or strand upon insertion therein, said terminal body means further having a second longitudinal bore portion integral to said first longitudinal bore portion and extending to said open end of said terminal body means and

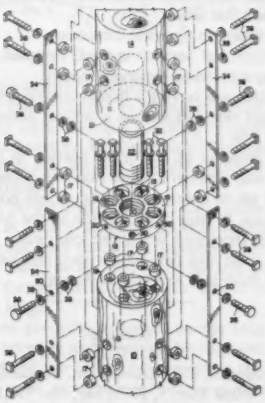
a plurality of separate and spaced deformable damping member means each comprised of an elongated plastic and resilient material positioned within said second longitudinal bore portion and adapted to surround the rope or strand as the undeformed rope or strand is passed through said second longitudinal bore portion into said first longitudinal bore portion, such that when said terminal body means is radially compressed inwardly, said first bore portion engages and compacts the undeformed rope or strand directly over the whole of its circumference and length within the first longitudinal bore portion thereby preventing the rope or strand from being withdrawn from the terminal body means and said second bore portion engages said plastic and resilient material of said deformable damping member means to cause the same to engage the undeformed wire rope or strand thereby dissipating transverse and longitudinal vibrations transmitted along the rope or strand towards the terminal assembly.

4,097,165

POLE TOP EXTENSION BRACKET

Jackson C. Quayle, 10225 Darrow Rd., Twinsburg, Ohio 44087

Continuation-in-part of Ser. No. 680,290, Apr. 26, 1976, Pat. No. 4,032,244. This application Apr. 29, 1977, Ser. No. 792,130
Int. Cl.² F16B *7/00*
U.S. Cl. 403—286 **8 Claims**



1. A bracket for connecting a top extension pole member to an existing pole member each having an end portion comprising: a metal plate having parallel planar surfaces and a centrally located shaft member extending perpendicularly outwardly therefrom to be received in at least one corresponding center bore provided in one of said pole members; apertures provided through said plate; first sleeves matingly embedded in the end portion of the existing pole member concentrically aligned with said apertures; relatively large fastening means passing through said apertures and through said sleeves into the top of said existing pole to attach and hold said metal plate thereon; strap members positioned vertically along the outer surfaces of said pole members and said plate with apertures therein; second sleeves matingly embedded in said outer surfaces of said pole members concentrically aligned with said strap apertures; fastening means to secure said straps to the periphery of said plate; and fastening means passing through said strap apertures and said second sleeves into said pole members to secure said strap members to said pole members to

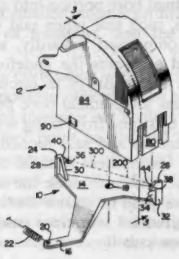
form a unified pole structure capable of resisting significant shear and bending moment stresses.

4,097,166

LATCH FOR FILM CARTRIDGE

Reid J. Stava, Fairport, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Sep. 20, 1976, Ser. No. 724,882
Int. Cl.[2] B25G 3/18
U.S. Cl. 403—321 **8 Claims**



1. A latch detachably engageable with a film strip cartridge of the type having at least a pair of side walls and an aperture in each of said side walls comprising:

a plate portion rotatably supported on a support means and having an axis of rotation substantially normal to the plate;

a first tab located on a first area of said plate;

a second tab located on a second area of said plate, opposite from said first area;

said tabs facing in opposite directions;

at least first and second spaced, opposed, parallel walls defining a cartridge restraint means;

said first sidewall having a first access port for said first tab;

said second sidewall having a second access port for said second tab;

whereby rotation of said plate portion in a first direction causes said first tab to enter said first access port, and said second tab to enter said second access port;

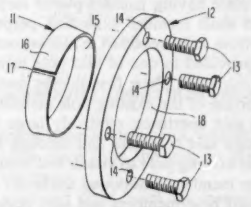
and rotation of said plate portion in the second direction, opposite from said first direction, causes said first tab to retract from said first access port, and said second tab to retract from said second access port.

4,097,167

THRUST COLLAR

Andrew Stratienko, 8503 Elliston Dr., Philadelphia, Pa. 19118

Filed Mar. 7, 1977, Ser. No. 775,174
Int. Cl.[2] B25G 3/20
U.S. Cl. 403—374 **11 Claims**



1. A thrust retaining device for positive axial securing of a part on a smooth shaft, comprising:

a contractible inner collar ring for retaining thrust and having an inner surface for gripping the outer surface of the shaft when contracted, an outer surface which is axially inclined, and an end surface for positioning against the part to be secured;

an outer collar ring to be placed over and for contracting the inner collar ring, the outer collar ring having an inner surface which is axially inclined at the same angle as the outer surface of the inner collar ring for engaging that surface, the end surface of the inner collar ring extending beyond the outer collar ring when the thrust retaining device is installed on the shaft, at least one of the axially inclined surfaces of the inner and outer collar rings having a stable anti-friction material preventing metal to metal contact thereon, and the inner and outer collar rings complying with following condition:

$$f > \tan(\alpha+\phi)$$

where:

f is the coefficient of starting friction of the inner collar ring on the surface of the shaft,

α is the angle of inclination of the axially inclined surface,

ϕ is the frictional angle of the axially inclined surface, the coefficient of starting friction of the axially inclined surface being tan ϕ, and

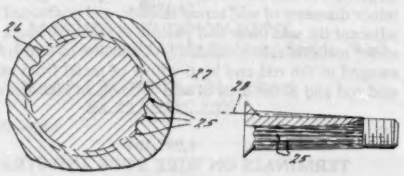
loading screw means attached to the outer collar ring for applying axial force in the direction of the inner surface axial inclination, whereby the outer ring slides relative to the inner ring and causes the inner ring to contract and grip the shaft.

4,097,168

PRESTRESSED CONNECTION AND FASTENER THEREFOR

Paul V. Pagel, Fullerton, Calif., assignor to Microdot Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 616,131, Sep. 24, 1975, Pat. No. 4,012,884, which is a continuation of Ser. No. 182,535, Sep. 21, 1971, abandoned. This application Mar. 21, 1977, Ser. No. 779,846
The portion of the term of this patent subsequent to Mar. 22, 1994, has been disclaimed.
Int. Cl.[2] B25G 3/36
U.S. Cl. 403—388 **4 Claims**



1. A bolt for forming a controlled radially prestressed connection between a plurality of members formed of material relatively softer than the material of said bolt, said members having aligned bolt-receiving bores defining a right circular surface of revolution, said bolt including a head and having an elongated shank having a nominal conical surface of revolution, said shank having circumferentially spaced arcuate continuously undulating axially extending alternate convex lobes, the crests of which define said conical surface of revolution, and concave grooves, the number of said convex lobes divided by a nominal circumference of the shank portion of said bolt resulting in a number in the range of 14 to 32, a radius of said bolt divided by the radius of said convex lobes resulting in a number within the range of 2 to 5, corresponding portions of the crests and roots of said convex lobes and concave grooves being spaced radially outwardly and inwardly, respectively, substantially the same distance from said conical surface of revolution, said convex lobes effecting a radially outward compression of the material surrounding said bores to prestress

said material to a degree sufficient to cause controlled plastic flow of said material circumferentially and radially inwardly into the concave grooves of said bolt to preclude excessive prestress of the material surrounding said bores, the maximum angle of metal flow being tangent to the arc of said convex lobes and concave grooves at the point of transition therebetween.

4,097,169

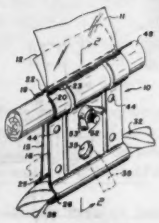
CLAMP ARRANGEMENT AND SYSTEM FOR SHEET MATERIAL

Clifford G. Kelly, #2-10492 135th St., Surrey, British Columbia, Canada (V3T 4C5)

Continuation of Ser. No. 620,110, Oct. 6, 1975, abandoned. This application Oct. 7, 1976, Ser. No. 730,371

Int. Cl.[2] F16B *2/02*

U.S. Cl. 403—391 **11 Claims**



1. A clamp arrangement for securing sheet material to a base, comprising a clamp having a pair of jaw plates with opposed grooves therein to act as jaws for receiving a rod with a sheet extending therearound and placed between the jaw plates, and clamping means for drawing the plates together to cause said jaws to grip the rod and thereby secure the sheet to said rod, said grooves being of a predetermined cross section to enclose a space therebetween shaped to receive a rod of substantially the same cross section, and said clamping means comprising a bolt secured to one of said plates and extending through a hole in the other of said plates, a locking bar mounted for rotation on the bolt adjacent said other plate, restraining means on the bolt to prevent movement of said bar outwardly along the bolt, and a protuberance on said adjacent plate near the bolt, said bar being rotatable on the bolt from a position clear of the protuberance, at which time the jaws are open, to a locking position on the protuberance to move the jaws towards each other to grip a rod and sheet therebetween.

4,097,170

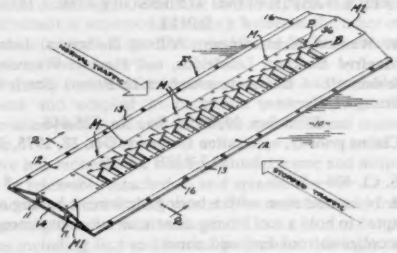
MODULAR TRAFFIC CONTROLLER

Harry D. Dickinson, 1681 Larco Way, Glendale, Calif. 91202

Filed Feb. 18, 1977, Ser. No. 769,940

Int. Cl.[2] E01F *13/00*

U.S. Cl. 404—6 **18 Claims**



1. An above-grade vehicle traffic controller permitting traffic flow in one direction while preventing traffic flow in the opposite direction, and including:

a low profile support to be transversely superimposed upon a pavement surface over which vehicular traffic is to pass and comprising, a pair of spaced rails secured to said pavement surface, there being an upwardly open channel between said secured rails;

and a plurality of modules selectively replaceable in a series along the rails and including barrier modules comprising, a slotted mounting plate secured to and extending between the rails, a barrier blade assembly journaled on spaced trunnions depending into said channel between the rails and with at least one barrier blade depressible through the mounting plate slotted therefor, and spring means extending from a lever point on the barrier blade assembly to the mounting plate and yieldingly urging the barrier blade assembly into stopped engagement with the mounting plate to be visibly exposed thereabove for vehicle control.

4,097,171

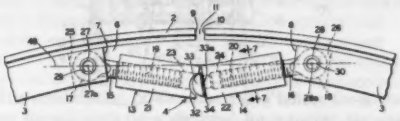
MANHOLE COVER SUPPORT RING

Raymond L. Fier, 5323 Pin Oak Ave. NW., Massillon, Stark County, Ohio 44646

Filed Sep. 16, 1977, Ser. No. 833,805

Int. Cl.[2] E02D *29/14*

U.S. Cl. 404—26 **20 Claims**



12. A manhole assembly including:

a. a manhole frame adapted to be placed below a pavement surface, said frame having a generally vertically extending inner conical surface defining a manhole opening, and an annular horizontal surface extending inwardly from said conical surface;

b. ring means having a generally vertically extending conical flange and an annular ledge mounted on the bottom of said conical flange and extending inwardly therefrom, said flange and ledge being split at a common point on their periphery forming a gap between spaced ends of said flange and ledge;

c. lever means pivotally mounted on the ring means and extending between and operatively engageable with the spaced ends of the ledge for expanding the ring means outwardly upon movement of the lever means from an open position to a closed position;

d. the ring means being supported on the horizontal surface of the manhole frame, with the ring means flange being in abutting engagement with the conical surface of said manhole frame when the lever means is in closed position; and

e. a circular manhole cover lying within the conical flange of the ring means and being supported on the ledge of the ring means, vertically raising the cover above the horizontal surface of the manhole frame.

4,097,172

COLD-PATCHING

Gerald W. Burkhart, Monaca, Pa., assignor to Arco Polymers, Inc., Philadelphia, Pa.

Filed Dec. 21, 1976, Ser. No. 753,052

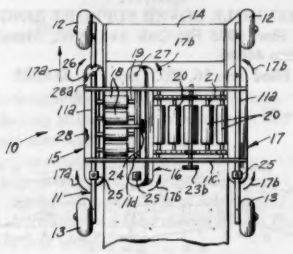
Int. Cl.[2] E01C *7/35*

U.S. Cl. 404—75 **8 Claims**

5. The method of repairing by cold patching a deteriorated pavement surface area which comprises:

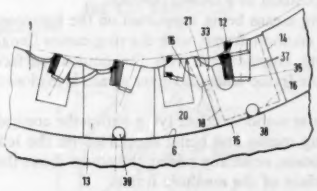
a. applying polystyrene dissolved in a volatile solvent to the deteriorated pavement area,
b. applying polystyrene dissolved in a volatile solvent to the cold patch material,
c. placing the treated cold patch material in the treated cavity of the deteriorated area,
d. applying pressure to said patched area,
e. allowing the solvent to volatilize and leaving deposited therethrough the polystyrene, whereby said deteriorated area and the cold patch applied thereto are interconnected by said polystyrene throughout the patch and the surrounding area to securely connect the cold patch material to the surrounding area.

4,097,173
SELF PLACING AUTOMATIC FORM
John R. Tout, 3530 Platt Ave., Fresno, Calif. 93702
Filed Sep. 23, 1977, Ser. No. 836,046
Int. Cl.[2] E01C *11/28*
U.S. Cl. 404—98 **4 Claims**



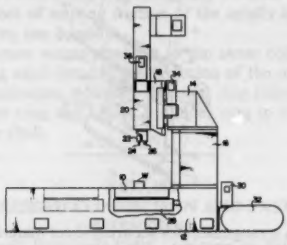
1. A self-placing automatic form machine, comprising a frame supported upon traction wheels, a concrete-mix hopper secured to one end of said frame, three self-placing form units secured to said frame for finishing the concrete mix, a plurality of parallel, spaced-apart rollers secured within said frame for engagement with the concrete mix, and a plurality of laterally moving rollers for finishing the concrete mix.

4,097,174
MILLING CUTTER
Werner Heinlein, Lichtenau, Germany, assignor to Hans Heinlein, Zirndorf bei Nuremberg, Germany
Filed Nov. 8, 1976, Ser. No. 740,077
Claims priority, application Germany, Sep. 4, 1976, 2639890
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—46 **7 Claims**



1. A milling cutter form milling workpieces, the cutter comprising:
a hub having an annularly extending circularly arched groove and a plurality of recesses therein;
a plurality of interchangeable inserts each having a circularly arched edge, each insert being mounted in one of said recesses with its said circularly arched edge resting in said annularly extending circularly arched groove;
clamping means for holding said inserts in said recesses;
a plurality of cutting elements mounted in said interchangeable inserts;
special recesses for inserts with outside guides provided in said hub and extending over its width;
inserts provided with U-shaped, finely machined, especially ground guides fitting over edges of said special recesses, one of said edges of at least one of said special recesses being provided with at least one step and
a wedge guided in said step.

4,097,175
MACHINE FOR DRILLING HOLES IN RIGHT-ANGULAR WORK SURFACES
Yoshihiro Tsukiji, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Jan. 5, 1977, Ser. No. 757,057
Int. Cl.[2] B23B *39/14, 41/00*
U.S. Cl. 408—23 **12 Claims**



1. In a machine tool, in combination, a table, a crossrail extending parallel to the surface of said table, a carriage mounted on said crossrail for movement therealong, means for moving said carriage along said crossrail, a ram mounted on said carriage for movement toward and away from said table, said ram being further movable with said carriage along said crossrail, means for moving said ram toward and away from said table, a toolhead pivotally mounted on that end of said ram which is disposed opposite to said table, a toolholder rotatably supported by said toolhead for rotation about an axis lying in a plane parallel to said crossrail and at right angles with the surface of said table, means for imparting rotation to said toolholder, a rotary cutting tool supported by said toolholder for simultaneous rotation therewith, said toolhead being pivotable relative to said ram about an axis at right angles with said crossrail and parallel to the surface of said table, and means for pivoting said toolhead relative to said ram wherein said tool has a first operative position such that its axis is perpendicular to the plane of said table and said tool has a second operative position such that its axis is at an angle other than a right angle with respect to the plane of said table.

4,097,176
PARTICLE-ASPIRATING ACCESSORY FOR A HAMMER DRILL
Karl Wanner, Echterdingen; Wilbert Reibetanz, Leinfelden; Manfred Bleicher, Leinfelden, and Herbert Wiesner, Leinfelden, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed Sep. 22, 1976, Ser. No. 725,446
Claims priority, application Germany, Oct. 28, 1975, 2548100
Int. Cl.[2] B23B *51/06*
U.S. Cl. 408—56 **5 Claims**

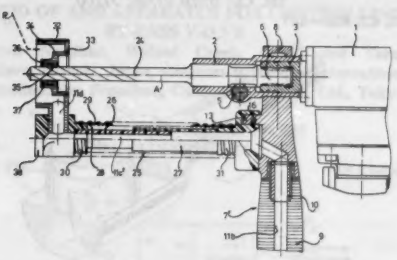
1. In combination with a boring implement having a chuck adapted to hold a tool having an axis, an accessory comprising:
a collar surrounding said chuck;
an elongated handle fixed on said collar and having an outer end turned away from said collar and from said imple-

ment, whereby said implement can be stabilized by means of said handle;

structure forming a throughgoing passage extending from said tool through said handle to said outer end thereof and including

a nipple extending in a direction parallel to said axis with said passage opening at said nipple in said direction,

a cup open away from said implement at said tool and having an interior connected to said passage, and



a telescoping tube extending between said cup and said nipple and formed of a pair of telescoping tube sections, a compression spring braced between said sections, and a tubular cuff connected to both of and surrounding said sections; and

means including a flexible conduit having an end portion attached to and in line with said handle at said outer end for drawing gas and particles from said tool through said passage.

4,097,177

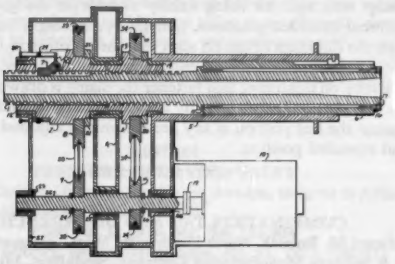
POWER HEAD DRILLING AND TURNING UNIT

Ross A. Close, 3831 Glenbrook Rd., Fairfax, Va. 22031

Filed Mar. 11, 1977, Ser. No. 776,637

Int. Cl.[2] B23B *47/18*

U.S. Cl. 408—132 **1 Claim**



1. A drilling and turning power head comprising

a box beam frame,

a spindle including an externally threaded portion at one end and means to accomodate a work holder at the other end,

means mounting said spindle on said frame for both rotatable and axial movement,

an internally threaded feed hub mounted for rotation on said frame and adapted to cooperate with the externally threaded portion of said spindle to form a thread connection,

a drive hub mounted for rotation on said frame and adapted to be releasably attached to said spindle,

a motor-driven drive shaft rotatably mounted on said frame generally parallel with said spindle,

means including first and second pulleys for drivingly connecting said drive shaft with said feed hub and said drive hub, said means being so adapted that said drive hub is rotated faster than said feed hub to effect axial feed of said spindle, and

means including a ring actuated dog for disconnecting said drive hub from said spindle so that continued rotation of said feed hub will cause the threaded connection between said feed hub and said spindle to reverse the feed and retract the spindle.

4,097,178

DIEHEAD CHASER CARRIER

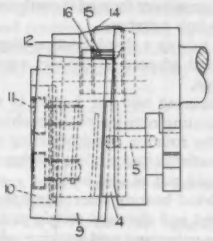
Denis Alfred Newell, Coventry, England, assignor to Alfred Herbert Limited, Coventry, England

Filed May 28, 1976, Ser. No. 690,837

Claims priority, application United Kingdom, Jun. 11, 1975, 24931/75

Int. Cl.[2] B23B *51/00, 51/14;* B26D *1/12*

U.S. Cl. 408—151 **16 Claims**



9. The combination of a carrier and a holder for a chaser element maintainable on a die head for securing the chaser element at a required helix angle to a workpiece, said holder comprising an elongated body having a longitudinal recess for receiving and aligning the chaser element with respect to the workpiece, said body being deformable at least in part transversely to said recess, and clamp means for securing said holder to said carrier and simultaneously deforming said body to secure said chaser element in said recess.

4,097,179

CUTTING TOOL HOLDER

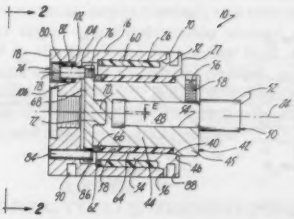
Richard C. Gersch, 617 June Ct., Traverse City, Mich. 49684

Filed Jun. 21, 1976, Ser. No. 698,264

The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.

Int. Cl.[2] B23B *29/034*

U.S. Cl. 408—151 **21 Claims**



1. A cutting tool holder, comprising:

a hub member having a mounting end and an outwardly extending end, said hub member having an axis and an axial bore formed in its outwardly extending end,

a cylindrical bushing adapted to fit within the hub bore and having an inner bore formed therethrough eccentric to the axis of the hub member,

a bar holder having a shank portion disposed in said eccentric bore and adapted to support a cutting bar having a cutting edge,

means for securing said bar holder in said eccentric bore while permitting rotation of the bushing in said hub member whereby rotation of said bushing in said hub member alters the radial distance of the cutting edge of said cutting bar from said axis of said hub,

a first tubular cylindrical bearing sleeve constructed of a compressible polymer and disposed within said hub bore between said hub member and said bushing, and

a second tubular cylindrical bearing sleeve constructed of a compressible polymer and disposed in said eccentric bore between said bushing and the shank of said bar holder.

9. A cutting tool holder, comprising:

a hub member having a mounting end and an outwardly extending end, said hub member having an axis and an axial bore formed in its outwardly extending end,

a cylindrical bushing adapted to fit within the hub bore and having an inner bore formed therethrough eccentric to the axis of the hub member,

a bar holder having a shank portion disposed in said eccentric bore and adapted to support a cutting bar having a cutting edge,

means for securing said bar holder in said eccentric bore while permitting rotation of the bushing in said hub member whereby rotation of said bushing in said hub member alters the radial distance of the cutting edge of said cutting bar from said axis of said hub,

a first cylindrical bearing sleeve constructed of a compressible material and disposed within said hub bore between said hub member and said bushing whereby substantially the entire outer periphery of said first bearing sleeve flatly abuts against the hub bore and whereby substantially the entire inner periphery of said first bearing sleeve flatly abuts against the outer periphery of said bushing, and

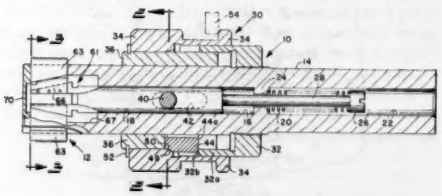
a second tubular cylindrical bearing sleeve constructed of a compressible material and disposed in said eccentric bore between said bushing and the shank of said bar holder whereby substantially the entire outer periphery of said second bearing sleeve flatly abuts against the eccentric bore and whereby substantially the entire inner periphery of said second bearing sleeve flatly abuts against the outer periphery of said bar holder.

4,097,180

CHASER CUTTING APPARATUS

James A. Kwieraga, Durham, Conn., assignor to TRW Inc., Cleveland, Ohio

Filed Feb. 10, 1977, Ser. No. 759,955
Int. Cl.[2] B23G *5/16*
U.S. Cl. 408—154 **9 Claims**



1. An apparatus for producing threads or other configurations comprising:

an elongated body;

a plunger member mounted for axial movement in said body and having inclined camming surfaces;

at least one chaser member seated on each of said camming surfaces for sliding movement relative thereto; and,

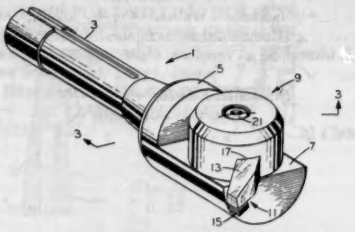
spring clip means extending generally radially outwardly from adjacent each camming surface, each clip means having a laterally extending resilient free end portion engaging an associated chaser and applying to said associated chaser a biasing force having a component acting to maintain said associated chaser in contact with its respective camming surface.

4,097,181

ROTARY CUTTING TOOL

Ted J. Fisher, 1322 Barhart Rd., Poplar Bluff, Mo. 63901

Filed Mar. 7, 1977, Ser. No. 774,782
Int. Cl.[2] B23B *27/00, 51/00*
U.S. Cl. 408—187 **3 Claims**



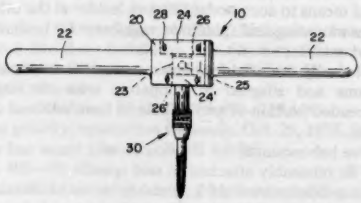
1. A rotary cutting tool having a shank, a generally cylindrical head at one end of the shank constituting its forward end, said head having a flat bed portion formed by a notch extending rearwardly from the forward end of the head, said notch having a width approximately equal to the diameter of the head and a depth approximately equal to one-half said diameter, and means for mounting a bit on the bed portion, said mounting means comprising a clamp generally cylindrical in shape for carrying the bit, said clamp being mounted on the bed portion by a threaded fastener extending through an axial hole in the clamp and into a tapped bore in the bed portion, the clamp being rotatable with respect to the bed portion for angular adjustment of the bit relative to the bed portion, said clamp having a groove therein offset and separate from said axial hole and extending completely across one face of the clamp with said bit being axially slidable in the groove to different extended positions, said groove having a depth less than the thickness of the bit such that the bit projects from the open side of the groove for engagement with said bed portion whereby on tightening said fastener the clamp is drawn toward the bed portion thereby rigidly to clamp the bit in said groove against the bed portion in any predetermined adjusted angular and extended position.

4,097,182

COMBINATION TAP AND DIE WRENCH

Edward M. Rolnick, North Dartmouth, Mass., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Aug. 22, 1977, Ser. No. 826,797
Int. Cl.[2] B23B *31/10*; B23G *5/04*
U.S. Cl. 408—239 R **6 Claims**



1. A combination tap and die wrench having a center portion and a pair of opposite arm portions extending outwardly from

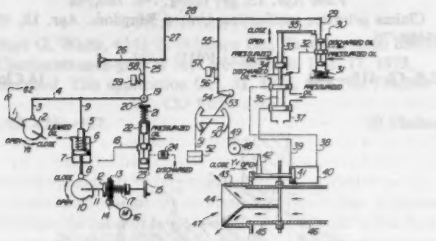
the center portion, said center portion including a pair of opposed flat surfaces with a central aperture extending through the thickness thereof from one of said surfaces to the opposite surface, and at least one receptacle on each of said surfaces about said central aperture, wherein said central aperture is adapted to receive and positively retain tapping apparatus and wherein each of said receptacles is adapted to receive and positively retain a threading die therein.

4,097,183

METHOD OF AND APPARATUS FOR CONTROLLING BY-PASS VALVE

Daumantas Namikas, Walnut Creek, Calif., and Takao Kuwabara, Hitachi, Japan, assignors to Bechtel International Corporation, San Francisco, Calif. and Hitachi, Ltd., Tokyo, Japan

Filed Jul. 9, 1976, Ser. No. 704,031
Int. Cl.² F01D *19/00*
U.S. Cl. 415—1 **13 Claims**



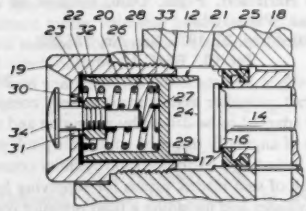
1. A method of controlling a by-pass valve for use in combination with a penstock by means of a flow rate regulating device for regulating a quantity of water flowing through said penstock, said method comprising the steps of cooperatively opening or closing said by-pass valve in response to the operation of said flow rate regulating device to maintain the total quantity of water passing through said flow rate regulating device and said by-pass valve constant when said by-pass valve is opened, and closing said by-pass valve at a sufficiently slow speed not to induce an increase in water pressure within said penstock during the normal condition of operation in which said flow rate regulating device is opened at a stable opening degree.

4,097,184

PRESSURE OPERATED VALVE

Gunnar Christer Hansson, Stockholm, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jul. 6, 1976, Ser. No. 702,984
Claims priority, application Sweden, Jul. 11, 1975, 7507972
Int. Cl.² F01D *17/00;* **G05D** *16/10;* **F16K** *31/12*
U.S. Cl. 415—49 **16 Claims**



1. Pressure operated valve for automatic shut-off of a pneumatic circuit, comprising:

a housing **(19)** connected to a pressure air source,

a valve body **(21)** movable within said housing between an open and a closed position, and having an area **(24)** facing the closing direction and an area **(22)** facing the opening direction,

a first passage means **(29)** continuously connecting the closing direction facing area **(24)** of the valve body **(21)** to the pressure air source when the valve body **(21)** is in both its open and closed positions,

spring means **(28, 33)** continuously biasing the valve body **(21)** toward its closed position,

a second passage means **(26)** which connects the opening direction facing area **(22)** of the valve body **(21)** to the pressure air source only when the valve body **(21)** occupies its closed position,

means defining a pressure chamber in communication with said opening direction facing area **(22)** of the valve body **(21)** for receiving pressure air via said second passage means **(26)** and for building up pressure from said pressure air source when said valve body **(21)** occupies its closed position after being open so as to stabilize said valve body **(21)** in said closed position after being open, and

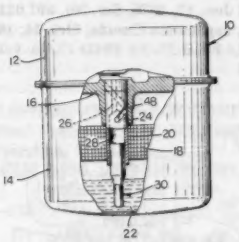
said valve body including means **(22)** for closing said second passage means **(26)** when said valve body **(21)** occupies its open position.

4,097,185

LUBRICATING DEVICE

Rudolf H. Wolf, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Sep. 13, 1976, Ser. No. 722,641
Int. Cl.² F04B *39/02*
U.S. Cl. 415—88 **2 Claims**



1. A pick-up tube, especially for use for supplying lubricant to lubricant passage means in a hermetic device which includes a fluid sump and a vertically disposed rotary shaft above the fluid level in the sump, said tube comprising: a larger diameter upper cylindrical portion open at the upper end and adapted for being fitted into a central bore in the shaft, said tube having a smaller diameter lower cylindrical portion adapted to be immersed in fluid in the sump and a tapering axial region connecting the upper and lower cylindrical portions, an inlet port extending axially into the lower end of said lower cylindrical portion, and an impeller blade disposed substantially diametrially inside said lower cylindrical portion.

4,097,186

MULTI-STAGE RING TYPE CENTRIFUGAL PUMPS WITH INDUCER MEANS

Allan R. Budris, Nutley, N.J., assignor to Worthington Pump, Inc., Mountainside, N.J.

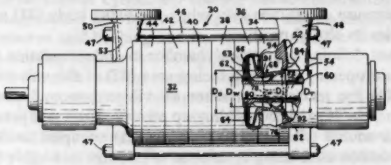
Filed Nov. 18, 1976, Ser. No. 742,899
Int. Cl.² F04D *29/44;* **F01D** *5/22*
U.S. Cl. 415—143 **27 Claims**

1. In a multi-stage ring type centrifugal pump,

a. pump casing means,

b. said pump casing means having an inlet for fluid to be pumped, and an outlet for pumped fluid,

c. a pump shaft rotatably mounted in said casing,
d. a plurality of serially arranged pumping stages having impellers therein connected to and driven by said pump shaft, said pump casing inlet and said pump shaft constructed to accomodate a removable first impeller and diffuser stage of said serially arranged pumping stages,
e. inducer means in said pump casing means removably associated with said shaft and with said pump casing inlet and occupying a position normally occupied by said first impeller and diffuser stage,



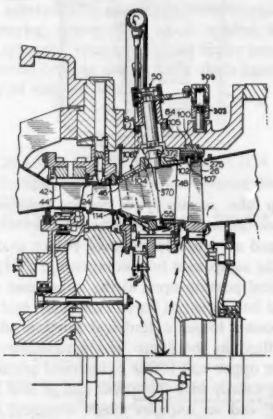
f. said inducer means having an inducer inlet in communication with said inlet for the pump and having an inducer outlet disposed to deliver pumped fluid to the suction eye of the impeller of the adjacent one of the plurality of serially arranged pumping stages, and
g. said plurality of serially arranged pumping stages connected to deliver pumped fluid to the outlet in said pump casing means.

4,097,187

ADJUSTABLE VANE ASSEMBLY FOR A GAS TURBINE

John Korta, Stoney Creek, Canada, assignor to Westinghouse Canada Limited, Hamilton, Canada

Filed Jun. 17, 1976, Ser. No. 697,021
Claims priority, application Canada, Oct. 14, 1975, 237568
Int. Cl.[2] F01B *25/10*; F01D *17/16, 9/04*
U.S. Cl. 415—161 **2 Claims**



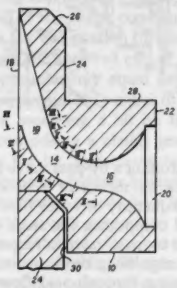
1. A vane assembly for a gas turbine engine the casing of which engine is provided with at least three spaced circumferential key grooves on the interior surface thereof to receive and anchor said vane assembly in place, said vane assembly being of arcuate shape and having inner and outer shroud sections being coupled together by a pair of stationary vanes to form an integral unit, a pair of rotatable vane members, each having an integral shaft means formed therein to provide a suitable axis of rotation for each vane, said inner and outer shroud sections being provided with suitable bearing means to receive said shaft means of said rotatable vanes, said rotatable vanes being mounted in nesting relationship with said stationary vanes in the bearings provided in said inner and outer shroud sections, a central projection means formed on said outer shroud section acts as a first locking member by keying said vane assembly into a first key groove on the interior of said casing, second and third arcuate locking members being keyed into second and third key grooves in the interior of said turbine casing, said second and third members also being keyed into a pair of key slots provided in said outer shroud, said key slots provided in said outer shroud being on opposite sides of and spaced apart from said central projection means, said vane assembly being located in said turbine casing such that the axis of rotation of each rotatable vane extends in a radial direction and passes through said first key groove.

4,097,188

NOZZLE INSERT FOR A TURBINE

Terence Owen Forster, 14 Stamford Rd., Exton, Oakham, Leics., England

Filed Apr. 13, 1977, Ser. No. 786,968
Claims priority, application United Kingdom, Apr. 15, 1976, 15458/76
Int. Cl.[2] F01D *9/02*
U.S. Cl. 415—202 **14 Claims**



1. A nozzle insert for a turbine said insert having a turbine blade-confronting surface, a working fluid passageway extending through said insert, an inlet and an exit to said passageway, said exit being a rectangular opening in said turbine blade-confronting surface, said passageway having an arcuate section adjacent said inlet and a rectilinear section adjacent said centre line through the rectilinear section of the passageway making an acute angle with said turbineblade confronting surface.

4,097,189

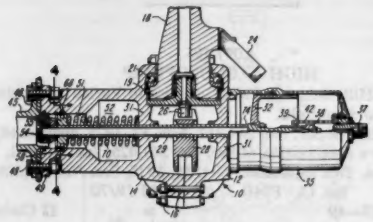
AIRCRAFT PROPELLER AND BLADE PITCH CONTROL SYSTEM

W. Benjamin Harlamert, Piqua, Ohio, assignor to Hartzell Propeller, Inc., Piqua, Ohio

Filed Sep. 20, 1976, Ser. No. 725,008
Int. Cl.[2] B64C *11/38*
U.S. Cl. 416—46 **20 Claims**

1. An aircraft propeller and control system comprising a propeller hub adapted to be driven by an engine and supporting a plurality of angularly disposed adjustable pitch propeller blades, means including a hydraulic fluid cylinder connected to adjust the pitch of said blades, means for supplying hydraulic fluid to said cylinder and including a fluid pressure responsive relief valve having means for relieving the pressure of the hydraulic fluid supplied to said cylinder when the pressure exceeds a predetermined pressure limit corresponding to a pitch position of said blades, a movable pitch control member adapted to be located within the aircraft cabin, and said relief

valve having a pressure member connected to move with said control member for infinitely varying said pressure limit of said



relief valve within a predetermined range for changing the pitch of said blades.

4,097,190

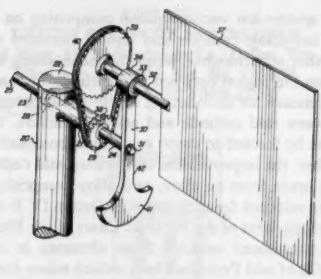
WIND MOTOR

Herbert O. White, 4242 E. Wilshire Dr., Phoenix, Ariz. 85008

Continuation-in-part of Ser. No. 641,390, Dec. 17, 1975, abandoned. This application Oct. 21, 1976, Ser. No. 734,390

Int. Cl.[2] F03D *3/02*

U.S. Cl. 416—117 **10 Claims**



1. A wind motor for receiving the force of the wind and for translating the generally linear movement thereof to rotary motion, said wind motor comprising:

(a) a stationary frame;

(b) a crank member including

(i) a crank shaft journalled in said frame for rotation about a first axis, and

(ii) a crank arm extending radially from said crank shaft;

(c) a wind blade carried by said crank arm and rotatable about a second axis spaced from and parallel to said first axis;

(d) timing means for maintaining a predetermined ratio between the speed of rotation of said wind blade about said second axis and the speed of said crank shaft about said first axis; and

(e) balance means rotatable in response to rotation of said crank member for dynamic balance of the moving mass of said wind motor,

whereby said wind motor is self-contained, single blade, modular unit.

4,097,191

OUTBOARD HUB

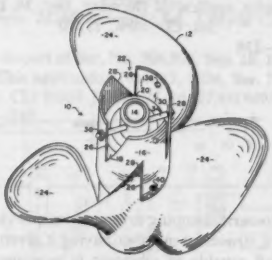
Bennie Genuardi, Tampa, Fla., assignor to Irving Navarre, Tampa, Fla.

Filed Mar. 24, 1977, Ser. No. 780,770

Int. Cl.[2] B63H *1/20*

U.S. Cl. 416—170 R **10 Claims**

1. An auxiliary hub device for use in combination with the propeller of an outboard drive marine engine, said auxiliary hub device comprising: sleeve means configured and dimensioned for sliding engagement with the hub of said propeller; a plurality of blade notches formed in said sleeve means on at least one end defining the periphery thereof, each of said notches being configured and dimensioned to receive a corresponding one of the blades of said propeller therein; and lock means operatively disposed on the end of said sleeve means opposite from said blade notches, whereby said auxiliary hub device may be secured to the propeller drive shaft in locking, interconnecting relation between said drive shaft and said propeller.



4,097,192

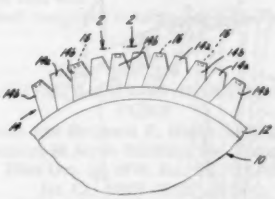
TURBINE ROTOR AND BLADE CONFIGURATION

Mark R. Kulina, Franklin Lakes, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Jan. 6, 1977, Ser. No. 757,302

Int. Cl.[2] F01D *5/10*

U.S. Cl. 416—175 **5 Claims**



1. A rotor for turbines, compressors or the like comprising an annular portion and a plurality of circumferentially-spaced blades each secured at one end to and projecting from said annular portion with the other end of said blades being free of any contact with each other, certain of said blades having means differentiating said blades from the remainder of said blades to provide two sets of blades in which, except for said differentiating means, the blades of each set are similar to the other blades of said set except for differences resulting from manufacturing tolerances such that, because of said differentiating means, the average of the natural frequencies of vibration of one of said two sets of blades differs from the corresponding average of the other set of said blades by a minimum percentage at least equal to the percentage spread of the natural frequencies of vibration of said blades resulting from manufacturing tolerances but no more than about 15%.

4,097,193

ELASTOMERIC DAMPING ARRANGEMENT

Klaus Brünsch, Weidach, and Emil Weiland, Hohenbrunn, both of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Germany

Filed Dec. 17, 1976, Ser. No. 751,698
Claims priority, application Germany, Dec. 24, 1975, 2558709
Int. Cl.[2] B64C *11/20*
U.S. Cl. 416—224 13 Claims

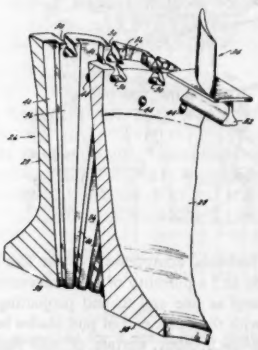
1. An elastomeric damping arrangement providing a damping force for a structural member having a given surface contour and being capable of vibrating in response to dynamic deformations, especially for an airfoil, comprising damping layer means, cover layer means, and means operatively interconnecting said layer means to each other in a surface contact fashion, to form an integral structure arranged in intimate contact with the structural member solely in regions thereof subject to said dynamic deformations and to said vibrations, said integral structure merging smoothly into said surface contour of said structural member in said dynamic deformation regions, said cover layer means being made of a high strength material having a high unidirectional rigidity which is effective in the direction of said damping force, said damping layer means being made of a viscoelastic material.

4,097,194

REDUNDANT DISC

William N. Barack, Morrow; Charles H. Gay, Jr., Loveland; Stephen W. Beekman, Fairfield, and Paul A. Domas, Cincinnati, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 22, 1976, Ser. No. 668,971
Int. Cl.[2] F01D *5/02*
U.S. Cl. 416—244 A 13 Claims



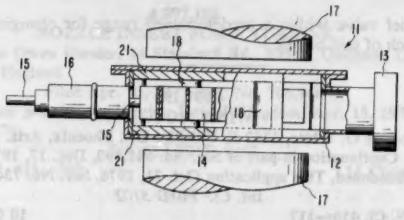
1. A rotatable disc comprising: a pair of, generally parallel plates for rotation about a common axis, each plate including a plurality of angularly spaced lands projecting axially from a face thereof and extending in a generally radial direction along the face, the lands of each plate intermeshing in alternating relationship with grooves formed between pairs of lands of the adjacent plate to prevent relative circumferential displacement of adjacent plate sectors; and means for tightly joining the plates together such that each land is in abutting contact with the adjacent plate; and wherein each plate is redundantly sized such that in the event of structural failure of one plate, the remaining intact plate can support the load of the failed plate.

4,097,195

HIGH VACUUM PUMP

Eugene F. Hill, Belmont, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 549,217, Feb. 12, 1975, abandoned, which is a continuation of Ser. No. 367,025, Jun. 4, 1973, abandoned. This application Oct. 10, 1975, Ser. No. 621,329
Int. Cl.[2] F04B *37/02;* H01J *19/70*
U.S. Cl. 417—49 12 Claims



1. In a sputter-ion vacuum pump comprising an evacuable chamber including cathode and anode members each positioned within said chamber, means for maintaining a magnetic field within the region between said cathode and anode members, lead means for introducing an electrical potential difference between said cathode and anode members, whereby a plasma can be formed to cause gas ions to bombard said cathode member; the improvement comprising said cathode member being made from an alloy, said alloy comprising a major constituent selected from elements in Group IV B of the conventional long form of the Periodic Chart of the Elements and a minor constituent selected from elements in other than Group IV B of said Periodic Chart, which minor constituent is an amount that causes the transition temperature for the transformation from the hexagonal close-packed crystal lattice form to the body-centered cubic crystal lattice form for said alloy to be lowered from the corresponding transition temperature for said major constituent alone.

4,097,196

PILOT OPERATED PRESSURE COMPENSATED PUMP CONTROL

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

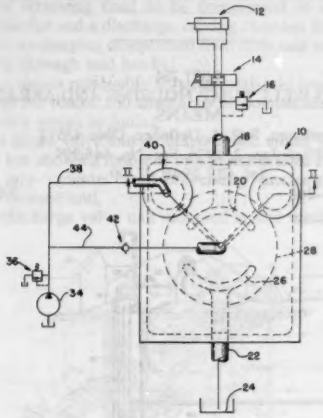
Filed Jun. 1, 1976, Ser. No. 692,178
Int. Cl.[2] F04B *1/30*
U.S. Cl. 417—222 6 Claims

1. In a pump having a pump body, a swash plate the rotational position of which controls the displacement of said pump and means mounting said swash plate for rotation about an axis generally centrally thereadjacent, an improvement for controlling an output from said pump, comprising:

means internal of said pump body and acting between said pump body and said swash plate for biasing said swash plate toward a zero displacement position corresponding to a minimum displacement of said pump; and

means responsive to discharge pressure of said pump reaching a first magnitude for overriding said biasing means and rotating said swash plate towards a full displacement position corresponding to a maximum displacement of said pump, said overriding means comprising servo valve

means within said pump body and pilot pump means acting to initially shift said servo valve means to allow



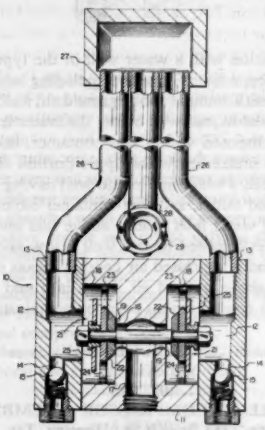
discharge pressure to be applied in opposition to said biasing means.

4,097,197

LIQUID PRESSURE INTENSIFIER

Joe Edward West, 11426 Goodnight La., Dallas, Tex. 75229

Filed Aug. 16, 1976, Ser. No. 714,355
Int. Cl.[2] F04F *7/02*; F04B *23/00*
U.S. Cl. 417—227 **8 Claims**



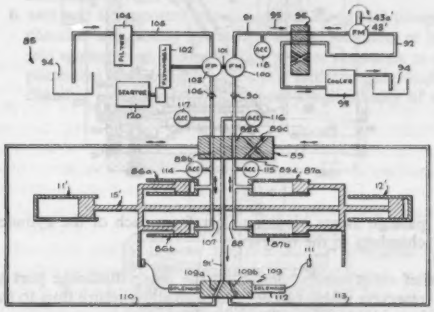
1. A high pressure intensifier for liquids comprising:
a housing having an intensifying chamber therein, said chamber being provided with an inlet, a low pressure outlet, and a high pressure outlet;
a valve in said chamber positioned to block flow through said low pressure outlet upon closure thereof;
means for closing said valve when the velocity of liquid flow therepast reaches a selected value;
means for opening said valve;
a ram tube connected to said inlet and extending linearly away therefrom;
and a reaction ram tube connected to the ram tube at its end remote from said housing, said reaction ram tube extending parallel to and lying closely adjacent said ram tube, and extending back toward said housing and terminating adjacent thereto in a liquid inlet;
said reaction ram tube being substantially equal to said ram tube in length and diameter.

4,097,198

INTERNAL COMBUSTION ASSISTED HYDRAULIC ENGINE

Allen R. Herron, 26235 Ravenhill Rd., Canyon Country, Calif. 91351

Continuation-in-part of Ser. No. 506,992, Sep. 18, 1974, Pat. No. 3,995,974. This application Nov. 15, 1976, Ser. No. 741,881
Int. Cl.[2] F04B *17/00, 23/06, 27/08, 49/00*
U.S. Cl. 417—245 **9 Claims**



1. A hydraulic engine comprising:
first and second sets of hydraulic cylinders, the pressurized fluid outlet of each cylinder being connectable to a common output line, the pistons of all cylinders being mechanically attached to a common shaft,
chamber assisted means for reciprocating said shaft alternately to pressurize the hydraulic fluid in said first and second sets, and
hydraulic fluid supply means including:
a hydraulic fluid reservoir,
a pump for pumping hydraulic fluid from said reservoir to all of the hydraulic cylinders in the set that is not currently being pressurized,
a motor driven by pressurized hydraulic fluid from said output line, and
a flywheel connected to said pump and to said motor.

4,097,199

DOUBLE ACTING RACK AND GEAR-DRIVEN PISTON PUMP

James R. Dole, and Benjamin F. Blaine, both of Hutchinson, Kans., assignors to Arrow Machine, Inc., Hutchinson, Kans.

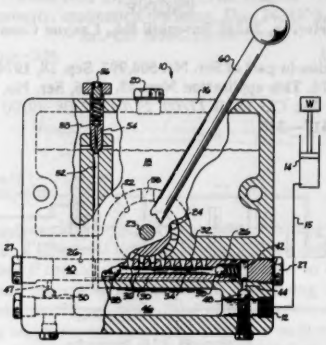
Filed Oct. 14, 1976, Ser. No. 732,495
Int. Cl.[2] F04B *49/00, 21/04*
U.S. Cl. 417—286 **7 Claims**

1. A hand-driven hydraulic pump and reservoir adapted to drive fluid motors comprising:
a housing;
an oil reservoir and a pump discharge port in the housing;
at least one cylinder bore in the housing;
a piston positioned in the bore forming two separate cylinder chambers one at each end thereof, a plurality of gear teeth disposed longitudinally on said piston forming a rack, a longitudinal passage through the piston supplying both cylindrical chambers and providing the sole inlet for the cylinder chambers;
a pinion gear mounted in the housing engaging said rack for driving the piston in a reciprocal motion;
handle means connected to said pinion gear;
first passage means in the housing connecting each cylinder chamber to the pump discharge port;
first check valve means positioned in each of the first pas-

sage means blocking flow from the discharge port to each separate cylinder chamber;

second passage means connecting the reservoir to each of the cylinder chambers through said longitudinal passage;

second check valve means positioned in each of the second



passage means blocking flow from each of the cylinder chambers to the reservoir;

and

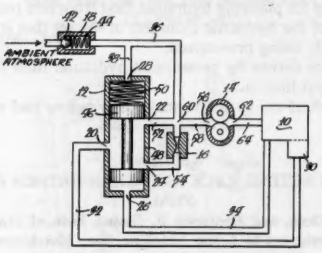
relief valve means connecting the pump discharge port to reservoir which can be opened to allow return flow to the reservoir.

4,097,200

SELF-PRESSURIZATION SYSTEM FOR GEARBOXES AND THE LIKE

Stephen S. Baits, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 3, 1977, Ser. No. 756,498
Int. Cl.² F04B 49/08
U.S. Cl. 417—302 **11 Claims**



11. For use with gear boxes, constant speed drives and the like employing a housing, a self-pressurization system comprising:

a pump having an intake port and a discharge port connected to the housing;

a first conduit open to the atmosphere communicating with said intake port;

a source of liquid; and

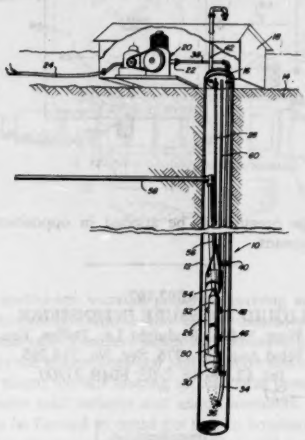
a valve responsive to a pressure differential between the housing and the atmosphere having an inlet and a pair of outlets, a second conduit between said source of liquid and said inlet, a third conduit having an orifice between one outlet and said intake port, a fourth conduit between the other outlet and said intake port, said valve providing communication between said second and third conduits when the housing pressure relative to atmospheric pressure decreases to a predetermined amount so that air from atmosphere flows through said first conduit to said intake port, said valve providing communication between said second and fourth conduits when the housing pressure relative to atmospheric pressure increases to said predetermined amount so that air flow is prevented to said intake port.

4,097,201

COMBINED WELL PUMP HOUSING AND AERATION MEANS

Gerald F. Nussbaum, R.R. 6, Defiance, Ohio 43512

Filed Jan. 2, 1976, Ser. No. 645,999
Int. Cl.² F04B 47/00
U.S. Cl. 417—360 **9 Claims**



1. In combination with a water well of the type subject to contamination by sulphur gas and including an upper end communicated with ambient above ground air, a closed bottom container disposed in said well below the water level therein, a water pump disposed within said container, said pump including a water intake below the upper portion of said pump and a water outlet, a water line in said well having an inlet end connected to said outlet, and said container including an upwardly opening water inlet spaced above said intake, a compressed air outlet disposed in said well below said container, and air pump and compressed air conduit means operative to pump ambient above ground air down into said well under pressure, said air conduit means being communicated with said air outlet.

4,097,202

AUXILIARY COMPRESSOR ASSEMBLY

Billy Frank Price, 7752 Braniff St., Houston, Tex. 77061

Filed Jun. 21, 1976, Ser. No. 698,107
Int. Cl.² F04B 21/00, 39/00; F16J 11/00
U.S. Cl. 417—454 **14 Claims**

1. An auxiliary compressor assembly for use in providing large volumes of high pressure compressible fluid adapted to be mounted with a conventional compressor having a piston mounted for reciprocal movement in a cylinder, comprising:

an auxiliary cylinder having a bore formed therethrough;

said auxiliary cylinder having a first end surface and a second end surface formed at opposite ends of said auxiliary cylinder;

said auxiliary cylinder being positioned with said first end surface of said auxiliary cylinder mounted on and adjacent to the conventional compressor cylinder and with said bore of said auxiliary cylinder aligned with the bore of the conventional compressor cylinder;

a head removably mounted on said second end surface of said auxiliary cylinder;

said head having an intake valving chamber formed therein for receiving fluid to be compressed in said auxiliary cylinder and a discharge valving chamber formed therein for discharging compressed fluid from said auxiliary cylinder through said head;

valve means removably mounted with said head for regulating the intake and discharge of compressible fluid, said valve means including:

an intake valve unit mounted in said intake valving chamber allowing intake of compressible fluid into said auxiliary cylinder and preventing discharge outwardly thereof; and,

a discharge valve unit mounted in said discharge valving chamber allowing discharge of compressed compressible fluid from said auxiliary cylinder through said head and preventing intake of compressible fluid therethrough;

said valve units reversible such that said intake valving chamber may act as said discharge valving chamber and said discharge valving chamber may act as said intake valving chamber upon respective reverse mounting of said intake valve unit in said intake valving chamber and reverse mounting of said discharge valve unit in said discharge valving chamber;

first releasable mounting means for releasably mounting said first end surface of said auxiliary cylinder with the conventional compressor cylinder; and,

second releasable mounting means for releasably mounting said second end surface with said head.

4,097,203

RECIPROCATING PISTON PUMP

Timothy John Selwood, Minstead, near Cadnam; Martin John Shelley Axtell, Lymington; John David Burton, St. Mary Bourne, near Andover, all of England; Peter Richard Selwood, deceased, late of Southampton, England; by Timothy John Selwood, executor, Minstead, near Cadnam, and by Martin John Shelly Axtell, executor, Lymington, both of England, assignors to William R. Selwood Limited, Eastleigh, England

Filed Apr. 14, 1976, Ser. No. 676,884

Claims priority, application United Kingdom, Apr. 15, 1975, 15368/75; Mar. 6, 1976, 9070/76

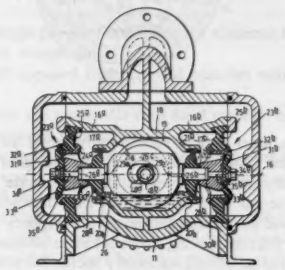
Int. Cl.[2] F04B *43/02, 21/04*

U.S. Cl. 417—480 **8 Claims**

1. In a pump composed of a body including at least two pumping chambers aligned along an axis, each of said chambers communicating at its opposite ends respectively with a pump inlet and a pump outlet, two actuators each disposed in a respective pumping chamber and reciprocable longitudinally of the pumping chamber axis, each actuator having a relatively rigid main central portion and a peripherally extending elastic sealing ring retained in a clearance space in non-sliding fluid-tight engagement between the main central portion and a lateral wall of the pumping chamber, valve means for each of the actuators controlling the flow of fluid through an associated one of the chambers from th inlet to the outlet, and drive means for reciprocating the actuators, the improvement wherein:

a. said pump further comprises a connecting member extending between, and joining, said main central portions of said actuators and forming with said main central portions a substantially rigid unit;

b. said unit is supported, for movement along said pumping chamber axis, solely by resilient means including at least said sealing rings and providing greater resistance to displacement of said unit in a direction radial to said pumping chamber axis than to displacement longitudinally of said



pumping chamber axis, to provide for high speed reciprocation of said unit;

c. said connecting member is provided with contact faces presented in opposite directions towards one another along said pumping chamber axis, said contact faces being of planar form and extending at right angles to the pumping chamber axis;

d. said drive means includes a rotary member mounted for rotation about a drive axis and having a part moved eccentrically with respect to said drive axis;

e. said eccentrically moved part is of circular form in a plane at right angles to said drive axis and is received between said contact faces, the diameter of said eccentrically moved part being only slightly less than the axial spacing between said contact faces;

f. said eccentrically moved part comprises a bearing having inner and outer races and intermediate rolling elements; and

g. said outer race as a peripherally extending outer surface which is crowned.

4,097,204

VARIABLE DISPLACEMENT GEAR PUMP

Walter E. Palmer, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 678,295, Apr. 19, 1976, abandoned.

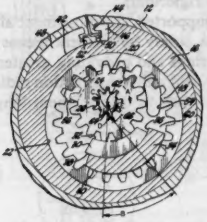
This application Apr. 22, 1977, Ser. No. 789,802

Int. Cl.[2] F04C *15/04, 1/06*

U.S. Cl. 418—19 **2 Claims**

1. An internal-external gear pump comprising a stationary housing; a drive shaft; an internal gear drivingly connected with said drive shaft and rotatably disposed in said housing for rotation about an axis coincident with the axis of said drive shaft; a control ring rotatably mounted in said housing on an axis eccentric to said internal gear; an external gear rotatably supported in a

cylindrical opening of said control ring for rotation about an axis coincident with the axis of said cylindrical opening, the axis of the external gear being eccentric to both said internal gear and said control ring, said external gear having a larger pitch diameter than said internal gear and said gears being in meshing engagement whereby said external gear is driven by said internal gear; the axis of said internal gear, said external gear and said control ring being aligned in a single plane disposed longitudinally of the axis of rotation of said drive shaft when the eccentricity between said internal gear and said external gear is maximum; a stationary arcuate sector portion integral with said housing disposed in the space between said gears substantially opposite the mesh point of said gears and



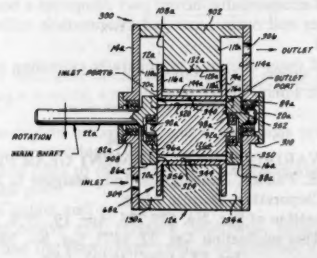
having an inner radius substantially equal to and disposed adjacent the outer radius of said internal gear and an outer radius eccentric to its inner radius; an arcuate control sector portion integral with said control ring disposed in the space between said gears adjacent the outer periphery of said stationary sector portion, having an inner radius substantially equal to the outer radius of said stationary sector portion and an outer radius substantially equal to and disposed adjacent the inner radius of said external gear; and means for rotating said control ring, control sector and external gear through an arc about the axis of said control ring relative to said stationary housing whereby the eccentricity between said gears is altered so that the fluid displaced by the meshing gears varies as the eccentricity is altered.

4,097,205

ORBITAL PUMP WITH INLET AND OUTLET THROUGH THE ROTOR

Edward L. Miles, 1960 Port Claridge Pl., Newport Beach, Calif. 92660

Filed Jan. 18, 1977, Ser. No. 760,273
Int. Cl.[2] F01C *1/02, 19/00, 21/08, 21/12*
U.S. Cl. 418—61 R **10 Claims**



1. An orbital-type pump or the like, which comprises:

(a) a generally cylindrical housing having a circumferential wall portion and opposing first and second transverse end walls and having therebetween an annular wall member, inwardly projecting from the circumferential wall portion,

(b) a generally spool shaped rotor having a central portion and first and second transverse ends which include, respectively, first and second outwardly projecting annular flanges,

said rotor being configured and disposed in the housing to have side surfaces of said first and second flanges in close proximity to corresponding first and second transverse side surfaces of the annular wall member, respectively, an inlet plenum being formed intermediate the housing first end wall and the rotor first end and first side surface, an outlet plenum being formed between the housing second end wall and the rotor second end and the second side surface, and a central chamber being formed between the inlet and outlet plenums,

(c) a drive shaft journalled for axial rotation in the housing, at least a portion of the shaft extending to axial ends of the rotor,

(d) connecting means for axially rotatably connecting the rotor to the drive shaft with an axial rotational axis of the rotor radially displaced from the rotational axis of the shaft to thereby cause the central portions of the rotor to orbit about the central chamber when the rotor rotates relative to the drive shaft axis,

(e) a plurality of vanes radially slidably mounted in the rotor, said vanes dividing the central chamber into a plurality of subchambers which change volume as the rotor orbits about the drive shaft axis,

(f) means defining a plurality of passages through the rotor communicating between the inlet and outlet plenums and the subchambers, each passage communicating with a different one of the subchambers and having an inlet end at the first rotor end and an outlet end at the second rotor end, and

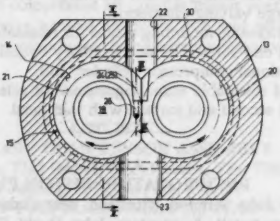
(g) flow control means associated with the drive shaft for causing closing of the inlet ends of preselected ones of the passages at first preselected rotor orbital positions and for causing closing of the outlet ends of preselected ones of the passages at second preselected rotor orbital positions.

4,097,206

GEAR PUMP OR MOTOR WITH BYPASS THROTTLE PASSAGE TO PREVENT CAVITATION

Erich Schonherr, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 18, 1976, Ser. No. 743,289
Claims priority, application Germany, Dec. 2, 1975, 2554105
Int. Cl.[2] F01C *19/08, 21/00;* F03C *3/00;* F01C *1/16*
U.S. Cl. 418—78 **10 Claims**



1. A gear pump or motor comprising a housing having a chamber bounded by a circumferential wall and two opposite end walls; a high pressure channel extending through said circumferential wall and having an inner end communicating with said chamber; a low pressure channel extending opposite said high pressure channel through said circumferential wall and likewise communicating at an inner end with said chamber; a pair of meshing external gears mounted in said chamber for rotation about axially parallel shafts, each of said gears having two opposite axial end faces, the flanks of the gear teeth of the two gears engaging each other between the inner ends of said channels along lines and forming between the engaging lines interstices increasing in the region of the inner end of said

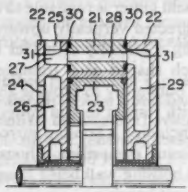
low pressure channel and decreasing in the region of the inner end of said high pressure channel; means mounting said shafts for rotation and engaging said opposite end faces of said gears; and a throttle passage in one of said mounting means having an inlet end in a region of said chamber which is under high pressure and an outlet end in the region of an interstice increasing in volume during rotation of the gears and which is sealed off by the engaging flanks from said high and low pressure channels.

4,097,207

CASING FOR LIQUID-COOLED ROTARY PISTON ENGINES

Kuniaki Kakui, Aki, Japan, assignor to Toyo Kogyo Co., Ltd., Japan

Filed Oct. 28, 1976, Ser. No. 736,326
Claims priority, application Japan, Mar. 15, 1976, 51-29561
Int. Cl.² F01C *21/06, 21/10*
U.S. Cl. 418—83 **4 Claims**



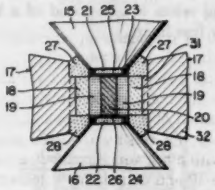
1. Casing for liquid-cooled rotary piston engine which comprises a rotor housing made of aluminum based alloy and having an inner wall of trochoidal configuration, a pair of side housings made of cast iron and secured to the opposite sides of the rotor housing at mating surfaces thereof to define a cavity of trochoidal configuration for receiving a substantially polygonal rotor therein, each of said side housings having cooling-liquid passage means opening to said mating surface at a plurality of locations, said rotor housing having cooling-liquid passage means opening to each of said mating surfaces at locations corresponding to locations of the openings of the passage means in said side housing and connected with the corresponding passage openings in the side housings, the cooling-liquid passage means formed in the rotor housing having a diametrical dimension at the opening in the mating surface smaller than that of the corresponding passage in the side housing so that a shoulder is formed at junction of each passage opening in the rotor housing with that of the side housing by an aluminum based alloy surface projecting into the opening.

4,097,208

ULTRAHIGH PRESSURE APPARATUS FOR DIAMOND SYNTHESIS

Hiroshi Ishizuka, No. 19-2, Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 646,168, Jan. 2, 1976, abandoned. This application Jul. 7, 1977, Ser. No. 813,709
Int. Cl.² B30B *11/32*
U.S. Cl. 425—77 **3 Claims**



1. An ultrahigh pressure apparatus for diamond synthesis or the like which comprises:

(1) a pair of opposed frustoconical punches with a flat end surface;

(2) an annular die made of a very hard metallic material and placed between said punches;

(3) a hollow cylinder made of a sintered alumina to be free of pores having an inner diameter substantially equal to that of the flat end surface of the punches;

(4) a pair of gaskets around and adjacent to the flank of said punches which gaskets each having an outer diameter larger than that of said hollow cylinder;

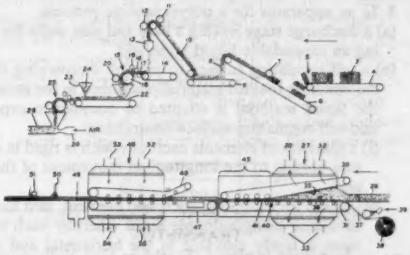
said die having at the middle portion thereof a substantially concentric cylindrical projection of an axial length equal to that of said hollow cylinder so that the bore is tightly fitted to the gaskets and the hollow cylinder.

4,097,209

APPARATUS FOR FORMING A MINERAL WOOL FIBERBOARD PRODUCT

John R. Garrick, and Richard E. Kottmeyer, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Mar. 23, 1977, Ser. No. 780,419
Int. Cl.² B29C *13/00*
U.S. Cl. 425—82.1 **3 Claims**



1. An apparatus for forming a mineral wool fiberboard product comprising:

(a) means for separating mineral wool fibers and means for intimately mixing said fibers with a thermosetting powdered binder,

(b) means for entraining said mixture of fibers and binder in an air stream including means for directing said air stream into a mat-forming zone formed by converging upper and lower forming wires,

(c) means for exhausting air through said forming wires whereby the fiber and binder mixture is collected as two layers on the forming wires with the two layers becoming consolidated at the nip opening formed between the converging wires, and

(d) compacting and heating means whereby the mat of fibers and resin is compacted and cured to form a mineral fiberboard product,

said exhaust system behind said wires being adjustable whereby the upper outer layer of fibers and binder initially formed on said wires is comprised of a layer of binder and predominantly fine fibers.

4,097,210

SYSTEM IN AN INDUSTRIAL POLYEXPANSION PROCESS

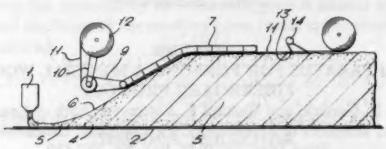
Federico Hernando Romanillos, Canarias, 46, Madrid, Spain

Continuation of Ser. No. 477,042, Jun. 6, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 646,367

Claims priority, application Spain, Aug. 22, 1973, 418.110; Oct. 3, 1973, 419.306

Int. Cl.[2] B29D *27/04*

U.S. Cl. 425—89 **13 Claims**



1. In an apparatus for a polyexpansion process:

(a) a discharge stage having a base and side walls for receiving an expandable liquid material;

(b) a self-regulating surface to prevent a crowning effect of the resulting foamed material positioned in the zone where the liquid material is adapted to commence expanding, said self-regulating surface comprising:

(i) a plurality of elements each of which is rigid in a direction normal to the longitudinal movement of the foam, and

(ii) means for mounting each said element, said means for mounting being a double pivot whereby each said element is freely movable in the horizontal and vertical directions in response to pressure exerted thereof by the expanding liquid material;

(iii) said means for mounting being located down stream of said discharge stage; and

(c) a separating material freely positioned between the foamed material and the self-regulating surface.

4,097,211

Patent Not Issued For This Number

4,097,212

PELLETIZER

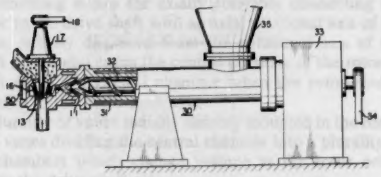
Yukimas Morishima, Kure; Minoru Yoshida, and Hideo Masuda, both of Hiroshima, all of Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Dec. 15, 1975, Ser. No. 641,157

Claims priority, application Japan, Jul. 25, 1975, 50-90303

Int. Cl.[2] B29C *17/14*

U.S. Cl. 425—313 **1 Claim**



1. A pelletizer of the type having an underwater cutter comprising

a horizontally located extruder unit having a housing within which a rotatable extruder screw is mounted with its axis extending longitudinally thereof to force material strands therealong;

a vertically located cutter unit including a rotatable cutter mounted therewithin and having its axis extending at right angles to said extruder unit axis, said cutter having driving means connected therewith and located directly thereabove so that said cutter is rotatable to cut the strands into pellets to be directed vertically upwards;

said cutter having a plurality of blades the outer edges of which are each shaped as a truncated cone extending upwardly and outwardly to provide an inclination of said outer edges with respect to said cutter unit axis;

said cutter unit including a housing surrounding said cutter, said cutter housing comprising a housing wall and a die wall with said housing wall being connected to an end of said extruder unit housing;

said die wall defining a chamber surrounding said cutter blade edges and spaced a predetermined uniform distance therefrom, said die wall extending upwardly and outwardly to form a first chamber area located upwardly from said blades that is of a larger size than a second chamber area located to surround said blades, said die wall formed to have the same inclination as said blade edge inclination;

a drive shaft connected to said cutter and extending upwardly therefrom, said cutter and drive shaft movable upwardly into said first chamber area to prevent clogging of pellets and said cutter and drive shaft movable downwardly into said second chamber area to regulate the size of the gap between said blades and said die wall;

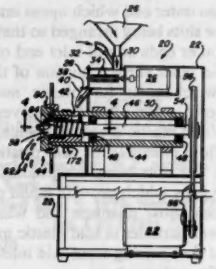
a plurality of die nozzles extending generally horizontally through said die wall to open into said second chamber area, said nozzles spaced vertically and provided to extrude the material therethrough from said extruder unit into said cutter unit and heating means provided in said die wall comprising a pair of jackets spaced respectively above and below adjacent to said outer edges of said cutter, said jackets connected to flow passages with a heating medium passing therethrough.

4,097,213

MECHANISM FOR ADJUSTING AN EXTRUSION DIE IN CEREAL GRAIN EXTRUDER APPARATUS

Kenneth H. McComb, and Timothy I. McComb, both of Denver, Colo., assignors to Dorsey-McComb Distributors, Inc., Denver, Colo.

Filed Feb. 28, 1977, Ser. No. 772,743
Int. Cl.[2] B29F 3/04
U.S. Cl. 425—376 B 9 Claims



1. An extruder apparatus for extruding a plurality of strands of gelatinous cereal grain material which thereafter form curled cereal grain food product, comprising, in combination:

a housing means;

an auger member mounted for rotation in an axially stationary position in said housing means, said auger member having helical groove means for moving cereal grain meal material from an inner axial position to an outer axial and discharge position and for operatively changing cereal grain meal into a gelatinous material upon rotation of said auger member;

a forming die member mounted in an axially stationary position adjacent the outer axial end of said auger member for rotation with said auger member, said forming die member having a frustroconically shaped outer die surface and a plurality of grooves formed in the outer die surface, the grooves extending generally in an axial direction;

a female die member mounted in a rotationally stationary position circumjacent at least a portion of said forming die member, said female die member having a frustroconically shaped inner die surface generally complimentary in shape to the outer surface of said forming die member, the inner die surface having a plurality of grooves formed therein and generally extending in an axial direction;

the inner and outer die surfaces of said forming and female die members respectively defining an annular extrusion orifice through which a plurality of strands of the gelatinous material are extruded, the strands being formed at least in part by the grooves; and

adjustment means operatively associated with said female die member for moving said female die member axially with respect to said forming die member to adjust the width of the annular extrusion orifice between the frustroconical die surfaces of said forming die member and said female die member to insure the change of cereal grain meal into the gelatinous material and regulate the extrusion of strands of gelatinous material from the annular extrusion orifice.

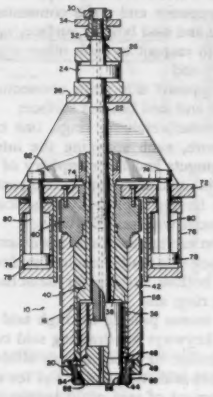
4,097,214

PARISON EXTRUSION HEAD

John Shao-Tze Hsu, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Dec. 8, 1976, Ser. No. 748,685
Int. Cl.[2] B29D 23/04
U.S. Cl. 425—466 4 Claims

1. An extrusion head for extruding a parison comprising: a housing having a plastic inlet and a plastic outlet; a plastic accumulating chamber in the housing for receiving the plastic from the plastic inlet; a longitudinally movable shooting mandrel located in said chamber, said shooting mandrel having at least two longitudinal portions of different cross section, with the larger cross section being less than the cross section of the chamber, the positions of the plastic inlet, plastic outlet, and shooting mandrel being such that when the shooting mandrel is



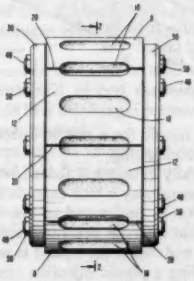
in the chamber full position, the larger cross section is at its closest point to the plastic outlet and furtherest point from the plastic inlet; program mandrel means operatively associated with said outlet for controlling the shape of the parison leaving the plastic outlet; and means operatively associated with said shooting mandrel for moving the shooting mandrel from the chamber full position to the chamber empty position to extrude the plastic from the chamber in the form of a parison.

4,097,215

SEGMENTED BRIQUETTING ROLL

Karl R. Komarek, Chicago, Ill., assignor to K. R. Komarek, Inc., Elk Grove Village, Ill.

Filed May 12, 1977, Ser. No. 796,233
Int. Cl.[2] B29C 1/00, 3/02
U.S. Cl. 425—471 8 Claims



1. A briquetting roll, comprising:

(a) a central core having two sides and being a substantially radially symmetrical polygonal prism having a diameter greater than its length and being adapted for rotation about its axis;

(b) each planar surface of the periphery of said polygonal core having at least one transverse groove;

(c) a plurality of end-to-end removable mold segments

around the periphery of said core, each of said mold segments comprising:

(1) an arcuate top working surface;

(2) a flat bottom surface opposite said working surface being in substantial contact and substantially coterminous with one of the planar surfaces of the periphery of said core, said bottom surface having at least one transverse groove substantially complementing one of said grooves in the coterminous planar surface of said core to form a transverse keyway;

(3) two opposite end walls connecting said top working surface and said bottom surface, said end walls diverging with respect to each other relative to said bottom surface; and

(4) two opposite side walls connecting said top working surface and said bottom surface;

(d) two annular retaining rings, one on each side of said central core, each spanning the interface between said mold segments and the periphery of said central core to secure said mold segments to said central core, said retaining rings having a plurality of spaced, centrally located holes coaxial with said keyways;

(e) means on each side of said core proximate its periphery and on each side wall of each of said mold segments proximate its bottom surface for detachably connecting said retaining ring; and

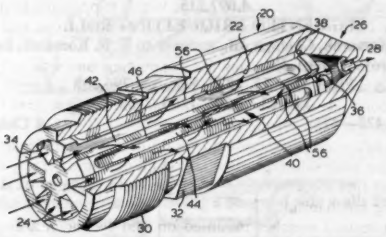
(f) affixing means passing through said retaining ring holes and said keyways for drawing said two annular retaining rings together to effect secure attachment of said mold segments to said central core and for aligning and preventing movement of said mold segments relative to the periphery of said central core.

4,097,216

FILTER FOR LIQUIDS

Ladislao W. Putkowski, Scarborough, Canada, assignor to Magna International Inc., Downsview, Canada

Filed Mar. 11, 1977, Ser. No. 776,811
Int. Cl.[2] B01D *35/02*
U.S. Cl. 425—568 **3 Claims**



1. An injection nozzle for a plastic injection moulding machine, the nozzle comprising:

a body of generally cylindrical form having:

an internal passageway which extends from an inlet end of said body to an outlet end of the body and through which plastic material can flow from said inlet end to said outlet end when the nozzle is in use, said passageway including a plastic injection opening at said outlet end of the body and a cylindrical filter chamber defined by a cylindrical inner surface portion of said body, one end of said chamber opening into said inlet end of said body and the opposite end of said chamber communicating with said plastic injection opening in the body;

an external surface which includes a generally conical surface portion at said outlet end of the body, tapering towards said plastic injection opening; an externally screw threaded portion adjacent said inlet end of the body, by which the nozzle can be secured in an injection moulding machine; and a plurality of flats adjacent said screw threaded portion at the side thereof remote from said inlet end of the body, by which the body can be turned for securing the nozzle in the machine;

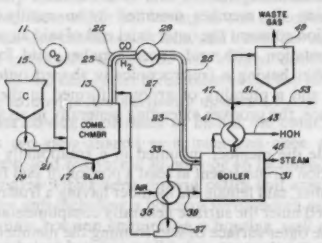
and a filter element removably received in said filter chamber and having an outer surface disposed closely adjacent said cylindrical inner surface portion of said body, said outer surface being defined by a plurality of slots which extend generally longitudinally of the filter element in circumferentially spaced positions and a corresponding plurality of intervening lands, each slot having a blind inner end and an outer end which opens into an end of the element and the slots being arranged so that alternate slots open at their outer ends at said inlet end of the body and define with said inner surface portion of the filter chamber, inlet flow channels for plastic material flowing through said body in use, while the intervening slots communicate with said plastic injection opening and similarly define outlet flow channels for said plastic material, the lands between the slots being longitudinally relieved to define filtering gaps which provide liquid communication between adjacent flow channels and which are dimensioned to prevent particles in said plastic material above a pre-determined size passing from said inlet flow channels to said outlet flow channels.

4,097,217

METHOD FOR CONVERTING COMBUSTOR FROM HYDROCARBONACEOUS FUEL TO CARBONACEOUS FUEL

Leonard J. Keller, Dallas, Tex., assignor to The Keller Corporation, Dallas, Tex.

Filed Dec. 9, 1976, Ser. No. 748,939
Int. Cl.[2] F23D *11/44*
U.S. Cl. 431—11 **5 Claims**



1. A method of converting a hydrocarbon-fired combustor to burn a carbonaceous fuel comprising the steps of:

a. providing an oxygen-enriched first combustion supporting gas to a primary combustion chamber;

b. burning the carbonaceous fuel in the presence of said first oxygen-enriched combustion supporting gas in said primary combustion chamber to produce a high temperature, combustible product gas comprising carbon monoxide and hydrogen and a molten slag that contains materials that would in a normal lower temperature combustion process be pollutants and pass out with the waste gases;

c. withdrawing said slag from said primary combustion chamber;

d. isolating and cooling said product gas with an inert gas that will not support combustion and simultaneously heating said inert gas;

e. passing the cooler product gas to said originally hydrocarbon-fired combustor;

f. passing the heated said inert gas in heat exchange relationship with a second combustion supporting gas to heat said second combustion supporting gas and simultaneously cool said inert gas;

g. passing the heated said second combustion supporting gas to said previously hydrocarbon-fired combustor and burn-

ing said product gas in said combustor to produce waste gases;

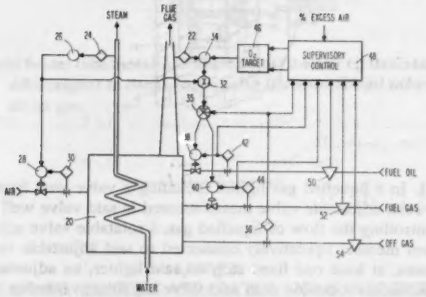
such that the atmospheric polutants in the waste gases are reduced by having removed said slag, and the danger of explosion is reduced by said inert gas isolating said product gas.

4,097,218

MEANS AND METHOD FOR CONTROLLING EXCESS AIR INFLOW

John W. Womack, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 9, 1976, Ser. No. 740,325
Int. Cl.² F23H *1/02*
U.S. Cl. 431—76 **11 Claims**



1. A control system for operating apparatus including a combustion zone and an exhaust flue and operable to derive variable amounts of heat energy from an off-gas fuel having a first heating value and an auxiliary fuel having a second heating value substantially greater than said first heating value, comprising:

sensor means disposed in flow relation with the exhaust flue for identifying the percentage of molecular oxygen in the system exhaust gases and outputting a flue oxygen signal;

first flow rate sensing means disposed in flow relationship with the fuels flowing to the combustion zone for developing signals representing the flow rate of said fuels;

second flow rate sensing means disposed in flow relationship with air flowing to the combustion zone for developing signals representing the flow rate of the air;

analyzing means in flow relationship with said off-gas fuel for outputting signals representing the relative percentages of the constituents of the fuels including the inert constituents of said off-gas fuel;

supervisory control means coupled to said flow rate sensing means and to said analyzing means and responsive to signals representing said flow rates and fuel constituents for outputting a target signal representing the proportion of molecular oxygen in the system exhaust gases which corresponds to the presence of a predetermined proportion of excess air in the combustion zone;

controller means responsive to said sensor means and said supervisory control means for developing a setpoint signal; and

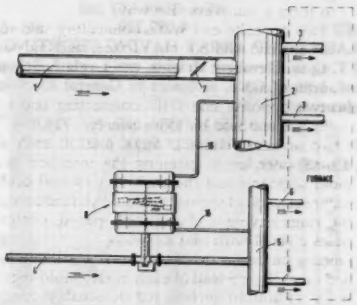
a ratio station for controllably varying the relative amounts of fuel and air flowing to the combustion zone in response to the setpoint signal.

4,097,219

SETTABLE REGULATOR DEVICE FOR GAS/AIR MIXTURE RATIOS

Oswald Prowald, Hoechen, Germany, assignor to Gerlach-Werke GmbH, Homburg, Germany

Filed Nov. 17, 1975, Ser. No. 632,785
Int. Cl.² F16K *31/365*; F23N *1/02*; G05D *11/02*
U.S. Cl. 431—90 **15 Claims**



1. A device for setting and automatically regulating the mixture ratio of a mixture of first and second gases supplied to an industrial furnace comprising:

(a) a first diaphragm pressure gauge comprising a first diaphragm mounted in a first housing;

(b) a second diaphragm pressure gauge having a second diaphragm mounted in a second housing; said second diaphragm pressure gauge being coaxial with said first diaphragm pressure gauge;

(c) an adjustable gas ratio setting mechanism for setting the ratio of said first and second gases supplied to said furnace and disposed between said first and second diaphragm pressure gauges;

(d) first conduit means for connecting one side only of said first diaphragm pressure gauge with a supply of a first gas for a furnace, said one side being remote from said gas ratio setting mechanism;

(e) second conduit means for connecting one side only of said second diaphragm pressure gauge with a supply of a second gas for a furnace, said one side being remote from said gas ratio setting mechanism;

(f) a first member mounted on said first housing for movement with said first diaphragm and extending freely from said first diaphragm pressure gauge to said gas ratio setting mechanism;

(g) a second member mounted on said second housing for movement with said second diaphragm and extending freely from said first diaphragm pressure gauge to said gas ratio setting mechanism;

(h) means for operatively connecting said gas ratio setting mechanism and said first and second members for movement together;

(i) first gas valve means comprising a body through which a first gas is supplied to a furnace and a valve member moveable in said body to regulate the flow of a first gas therethrough;

(j) valve actuating means for actuating said valve member comprising an actuating arm operatively connected to said first diaphragm on the side thereof remote from said gas ratio setting mechanism for movement with said first diaphragm and connected to said valve member such that said valve member is moved by movement of said first diaphragm.

(k) a third diaphragm mounted on said valve body and positioned to be acted on one side thereof by a first gas regulated by said valve member, and the other side of said third diaphragm being open to said remote side of said first

diaphragm pressure gauge, said other side being positioned to be acted on by a supply of a first gas supplied by said first conduit means; and

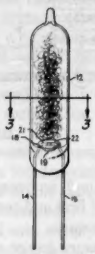
(l) means operatively connecting said third diaphragm and said valve actuating arm for movement therewith whereby a change in pressure in a first gas supplied to said valve body and acting on said valve member is opposed by such change in pressure acting on said third diaphragm.

4,097,220

FLASH LAMP ARRAY HAVING SHORTING LAMPS

Paul T. Cote', Cleveland Heights, and Lewis J. Schupp, Chesterland, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 16, 1976, Ser. No. 724,014
Int. Cl.[2] F21K *5/02*
U.S. Cl. 431—95 A **4 Claims**



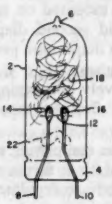
1. A shorting type of flash lamp comprising an elongated bulb containing combustible material and having a pair of lead-in wires sealed through a base of said bulb, the inner end regions of said lead-in wires being bent transverse to the length of said bulb and positioned in mutual side-by-side spaced apart relationship over said base, and a single mass of primer material contained in said bulb over said base thereof and bridging across and completely covering the bent end regions of the lead-in wires, said primer material being a type which leaves a relatively low resistance residue after the lamp is flashed.

4,097,221

PHOTOFLASH LAMP WITH COMBUSTIBLE FILAMENT

John W. Shaffer, and Emery G. Audesse, both of Williamsport, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 25, 1974, Ser. No. 526,642
Int. Cl.[2] F21K *5/02*
U.S. Cl. 431—95 R **8 Claims**



1. A photoflash lamp comprising:

an hermetically sealed, light-transmitting envelope;

a quantity of combustible fill material located in said envelope;

a combustion-supporting gas in said envelope; and

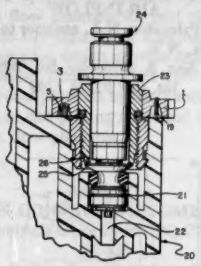
ignition means disposed in said envelope in operative relationship with respect to said combustible fill material, said ignition means including a pair of lead-in wires extending into said envelope, and a combustible filament having a substantially constant cross-section of the order of one square mil attached to and extending between said lead-in wires within said envelope, the sale material of said filament being selected from the group consisting of zirconium, hafnium, titanium, uranium, thorium, and the rare earth metals, and alloys comprised principally of one or more materials of said group.

4,097,222

ADJUSTMENT DEVICE FOR LIQUEFIED GAS LIGHTERS

Edmond L. J. Faudemay, Annecy-le-Vieux, France, assignor to S.T. Dupont, Paris, France

Filed Mar. 19, 1976, Ser. No. 668,558
Claims priority, application France, Mar. 21, 1975, 75 08909
Int. Cl.[2] F23Q *2/00*
U.S. Cl. 431—143 **8 Claims**



1. In a liquefied gas lighter including a valve well formed therein, adjustable valve means secured in said valve well for controlling the flow of liquefied gas, a rotatable valve adjustment member operatively connected to said adjustable valve means, at least one fixed stop on said lighter, an adjustment mechanism rotatable with said valve adjustment member and including at least one movable stop intended to interact with said fixed stop in order to limit rotation of said adjustment mechanism, whereby to limit the range of flow control of the liquefied gas; the improvement in which said adjustment mechanism comprises a milled wheel provided with an annular groove having an end wall, into which said fixed stop fits with clearance, said movable stop being formed in said end wall of said groove.

4,097,223

FLASH-TUBE IGNITION SYSTEM

John J. Garnier, Hales Corners, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 4, 1976, Ser. No. 729,354
Int. Cl.[2] F23C *3/10*
U.S. Cl. 431—191 **8 Claims**

1. A combustible fuel gas burner assembly comprising:

feeder tube means;

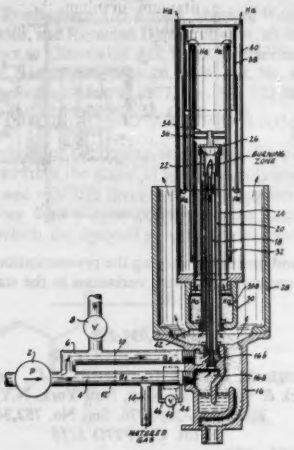
supply means feeding air and gas to one end of said feeder tube means for combustion at the other end of said feeder tube means to form a burning zone thereat;

an exhaust tube having an inlet at said burning zone for carrying away the products of said combustion and, in the absence of said combustion, for carrying away the mixture of said air and gas;

means for varying the ratio of air to gas in said mixture in said exhaust tube such that the flame propagation speed of said mixture in said exhaust tube changes through a spectrum of values at least one of which is greater than the flow velocity of said mixture in said exhaust tube;

an ignition source spaced from said burning zone for igniting said mixture in said exhaust tube when said flame propagation speed is greater than said flow velocity, whereby said

exhaust tube also serves as a flash-tube through which a flame travels from said ignition source to said burning zone;



said feeder tube means and said exhaust tube being stationary with respect to each other during variance of said ratio of air to gas.

4,097,224

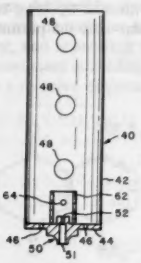
STEAM GENERATING APPARATUS AND GAS BURNER

Ralph D. Cooksley, 346 Barbour Rd., New Britain, Conn. 06053

Filed Mar. 15, 1976, Ser. No. 677,178

Int. Cl.[2] F23D *15/02, 13/40*

U.S. Cl. 431—352 **5 Claims**



1. A gas burner which comprises a base including means for connection to an associated source of a supply of a fluid fuel, a first tubular sleeve of generally circular cross section having one end affixed to said base in fluid communication with said means for connection, and a second tubular sleeve of generally circular cross section coaxial with said first sleeve and having a diameter large than said first sleeve disposed with one end thereof affixed to said base and having the other end extending beyond the other end of said first sleeve to provide an annular spacing therebetween extending upwardly from said base, each of said sleeves having apertures extending therethrough into the cavity defined therewithin and spaced from said other end thereof, said base having a plurality of axially extending apertures therethrough opening into said annular spacing.

4,097,225

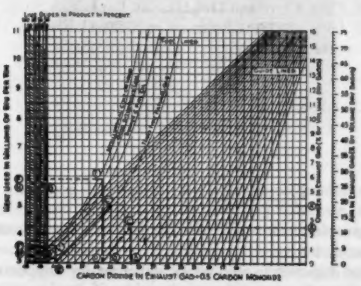
PROCESS AND APPARATUS FOR CALCINING LIMESTONE

Terence Arthur Rourke, Upper Long Beach Rd., R.R. 3, Nelson, British Columbia, Canada (VIP5P6)

Continuation of Ser. No. 658,576, Feb. 17, 1976, Pat. No. 4,031,183, which is a continuation-in-part of Ser. No. 559,193, Mar. 17, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 760,112

Int. Cl.[2] F27B *1/26*

U.S. Cl. 432—96 **7 Claims**



1. An apparatus for the production of calcined lime comprising:

a refractory lined vertical shaft provided with material feed means and gas exhaust means;

cooler means in communication with the lower end of said said vertical shaft and provided with means to withdraw calcined lime from said apparatus;

means for admitting air continuously into said cooler;

a plurality of injector means spaced around said shaft in a horizontal plane spaced from said lower end thereof for introducing fuel into said shaft; and

means for supplying fuel at a pressure between 2000 and 15000 psi to each of said injector means in a predetermined sequence at a pulsed rate between 100 and 500 injections per injector per minute, said injections occuring in a time period between 0.02 and 0.2 seconds with a time period of 0.1 to 0.5 seconds between injections, the time period between injections being longer than the time of the injections.

4,097,226

FURNACE FOR PRACTISING TEMPERATURE GRADIENT ZONE MELTING

Carl A. Erikson, Schenectady; John O. Fielding, Ballston Lake; Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,513

Int. Cl.[2] F24J *3/00*

U.S. Cl. 432—120 **25 Claims**

1. An apparatus for the simultaneous processing of one or more bodies of semiconductor material by temperature gradient zone melting, said apparatus comprising:

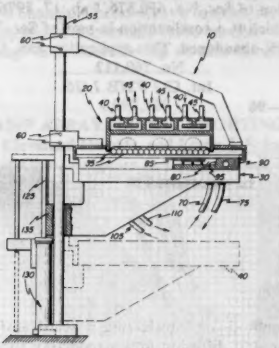
a closable work chamber for receiving said semiconductor bodies for processing;

a radiative heat source facing internally of said work chamber, said heat source comprising a first closure member for said work chamber;

a heat sink provided with a multiplicity of closely packed radiation attenuating cavities disposed in a major surface thereof facing internally of said work chamber and located opposite to, and facing, said heat source whereby when radiation is emitted from said heat source to said cavities the radiation is repeatedly reflected within the interiors of said cavities to the extent of substantially

complete attenuation, said heat sink comprising a second closure member for said work chamber;

said closure members defining at least in part said work chamber and at least one of said closure members being



movable to allow access to the interior of said work chamber, and

means disposed in said work chamber for supporting said bodies of semiconductor material.

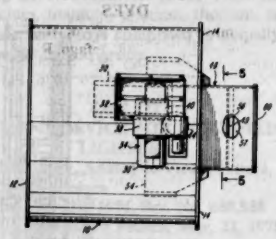
4,097,227

AIR MOVING DEVICE WITH OIL FIRED HEATING APPARATUS

James A. Brock, Sidney, Ohio, assignor to Aerovent, Inc., Piqua, Ohio

Filed Jun. 14, 1976, Ser. No. 695,473
Int. Cl.[2] F27B *17/00*
U.S. Cl. 432—187 **24 Claims**

16. Apparatus for flowing heated air in direct contact with cereal grains, tobacco and like material for drying or curing thereof, including means for generating and directing a forced flow of air, said means operating against a static pressure varying with the restriction to flow imposed by said materials, means for heating the flowing air including means defining a combustion chamber positioned in said forced air flow and providing an outlet from said chamber through which products of combustion escape to join said forced air flow against the resistance of said static pressure, means for pressurizing said combustion chamber using air supplied thereto for com-



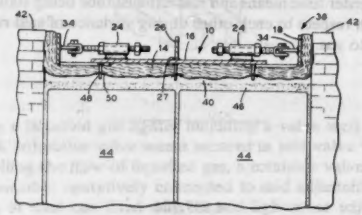
bustion, and means for varying the pressurization of said chamber in correspondence with variations in the static pressure.

4,097,228

FURNACE COVER

Denys Reginald Rosling, Graniteville, S.C., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,341
Int. Cl.[2] F27D *1/18*
U.S. Cl. 432—250 **7 Claims**



1. A cover for sealing a furnace opening comprising a metal backing, panels disposed about the perimeter and extending transversely of the backing, flexible insulation material lining and overlappingthe backing and panels, and means connected to the panels and backing for adjustably moving the panels and the insulation material associated therewith in the direction of the perimeter of the furnace opening to bring about sealing contact of the insulation with the perimeter of the opening.

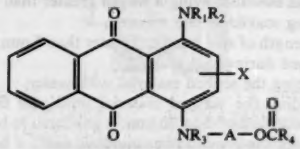
4,097,229

METHODS FOR DYEING OR PRINTING USING AMINO-ANTHRAQUINONE REACTIVE DISPERSE DYES

Stefan Koller, Ramlinsburg; Urs Karlen, Magden; Werner Kneubuhler, Bockten, and Raymond Defago, Riehen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 689,985, May 26, 1976, Pat. No. 4,044,029.
This application Mar. 1, 1977, Ser. No. 773,403
Int. Cl.[2] D06P *1/38;* C09B *1/16*
U.S. Cl. 8—1 A 12 Claims

1. In the method for the dyeing or printing of organic fiber material selected from the group of synthetic polyamide, natural polyamide and mixtures thereof which comprises contacting the said fiber with a dyestuff therefor, the improvement according to which the dyestuff is a reactive disperse dye of the formula



wherein

R_1 represents hydrogen or alkyl,

R_2 represents hydrogen, alkyl, cycloalkyl, aralkyl or substituted or unsubstituted phenyl,

R_3 represents hydrogen or alkyl,

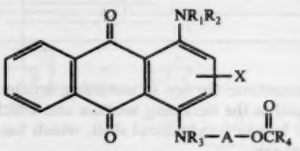
R_4 represents an alkyl radical of 1 to 6 carbon atoms which is substituted in α-position, or in α- and β-position, by halogen, or represents an α,β-unsaturated alkene radical which can be substituted in α- or β-position by halogen,

A represents an alkylene or cycloalkylene radical which optionally contains oxygen or sulphur,

X represents hydrogen, chlorine, bromine, cyano or $COOR_5$, and

R_5 represents alkyl.

2. In the dry heat transfer dyeing or printing process which comprises bringing an organic fiber material selected from the group of synthetic polyamide, natural polyamide and mixtures thereof into contact with the treated face of a carrier sheet containing at least one sublimable dyestuff, subjecting the material and carrier while in contact to a heat treatment to effect dyestuff transfer, and separating the material from the carrier sheet, the improvement according to which at least one sublimable dyestuff is a reactive disperse dye of the formula



wherein

R_1 represents hydrogen or alkyl,

R_2 represents hydrogen, alkyl, cycloalkyl, aralkyl or substituted or unsubstituted phenyl,

R_3 represents hydrogen or alkyl,

R_4 represents an alkyl radical of 1 to 6 carbon atoms which is substituted in α-position, or in α- and β-position, by halogen, or represents an α,β-unsaturated alkene radical which can be substituted in α- or β-position by halogen,

A represents an alkylene or cycloalkylene radical which optionally contains oxygen or sulphur,

X represents hydrogen, chlorine, bromine, cyano or $COOR_5$, and

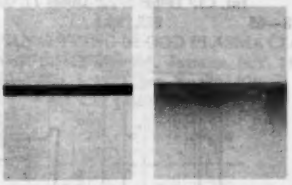
R_5 represents alkyl.

4,097,230

METHOD FOR TRANSFERRING HEAT-TRANSFERABLE DYES

M. Akram Sandhu, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 8, 1976, Ser. No. 730,884
Int. Cl.[2] D06P *5/00;* C08G *63/12*
U.S. Cl. 8—2.5 A 15 Claims



1. In a method for transferring a heat-transferable dye by vaporization and diffusion into a receiving substrate, the improvement comprising diffusing the heat-transferable dye into a dye receiving element comprising a transparent layer containing an amorphous, solvent soluble, aromatic polyester comprising at least 30 mole percent of its recurring units comprised of the condensation of aromatic diol having the general formula:

HO—AR—X—AR—OH

or the condensation residue of aromatic dicarboxylic acid having the general formula:

HOOC—AR—X—AR—COOH

wherein AR is an aromatic radical and X is a saturated gem-bivalent radical having a saturated polycyclic three-dimensional structure that includes a saturated bicyclic atomic bridged hydrocarbon ring member.

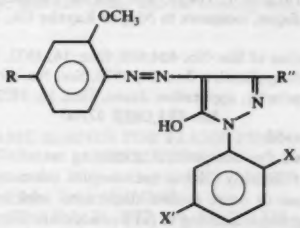
4,097,231

METAL-CONTAINING POLYPROPYLENE DYED WITH MONOAZO 1-ARYL-3-ALKYL-5-PYRAZOLONES

Raouf Botros, Beech Creek, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Filed Mar. 23, 1977, Ser. No. 780,405
Int. Cl.[2] C09B *27/00, 45/00*
U.S. Cl. 8—41 D 5 Claims

1. Dyed metal-containing polypropylene fibers, the dye being of the structure:



where

R is H or alkoxy of 1–4 carbons,

R″ is alkyl of 1–4 carbons,

X is H, chloro or bromo, and

X′ is H, chloro or bromo;

and the metal of said metal-containing polypropylene fibers being selected from the group consisting of chromium, cobalt, nickel, aluminum and zinc.

4,097,232

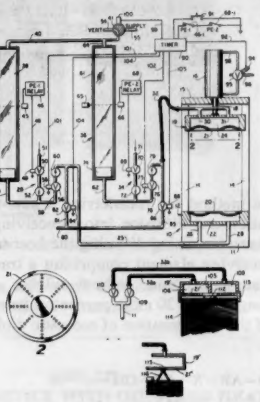
METHOD AND APPARATUS FOR TREATMENT OF YARN IN PACKAGE FORM

Edward J. Negola, Atlanta, and Jerald Brown, Jasper, both of Ga., assignors to Glen Head, Inc., Jasper, Ga.

Continuation-in-part of Ser. No. 628,374, Nov. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 541,127, Jan. 15, 1975, abandoned. This application Dec. 4, 1975, Ser. No. 636,701

Int. Cl.[2] D06P 5/22; D06B 11/00

U.S. Cl. 8—65 19 Claims



1. The process of treating a mass of yarn in package form comprising the steps of infusing a yarn treating agent into selected portions of the outer surface of said package, and introducing a heated fluid under pressure into said selected portions.

4. The method of treating a mass of yarn in package form to create repeating sequences of contiguous lengths of yarn having differing dye susceptibility comprising the steps of infusing a dye acceptance modifier into selected portions of the outer surface of said package, and subjecting said selected portions of said package to a heated fluid under pressure to cause said modifier to at least partially penetrate said package.

4,097,233

BASIC DYE COMPOSITION

Masaoki Takahashi, Tokyo, and Michio Fumishi, Fukuyama, both of Japan, assignors to Nippon Kayaku Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 424,699, Dec. 14, 1973, abandoned. This application Jun. 24, 1976, Ser. No. 699,501

Claims priority, application Japan, Dec. 16, 1972, 47/126522

Int. Cl.[2] C09B 67/00

U.S. Cl. 8—83 5 Claims

1. A basic dye composition consisting essentially of a finely dispersed difficultly soluble dye complex salt consisting essentially of one or more anionic dispersants which are selected from the group consisting of (a) a condensate of formaldehyde with naphthalenesulfonic acid, (b) a condensate of formaldehyde with methylnaphthalenesulfonic acid (c) Lignin sulfonic acid and (d) sodium and ammonium lauryl sulfate and one or more water-soluble basic dyes and optionally water, said composition having been prepared by a process consisting essentially of the step of dissolving or suspending 1 part of water-soluble basic dye in water, mixing 1 to 15 parts said anionic dispersant with the solution and optionally drying if the basic dye composition is intended to be powder.

4,097,234

METHOD FOR PREPARING DISPERSION OF COLLAGEN FIBER

Takeshi Sohde, Chiba; Astuko Gotoh, Ichikawa; Kuniharu Iwamoto, Sohka, and Yasushi Okamoto, Ichikawa, all of Japan, assignors to Nippi, Incorporated, Tokyo, Japan

Filed Dec. 10, 1976, Ser. No. 749,307

Int. Cl.[2] C14C 3/00

U.S. Cl. 8—94.19 9 Claims

1. A method of preparing an aqueous dispersion of collagen fibers which comprises:

(a) soaking a material including bundles of collagen fibers in an aqueous solution 0.3 to 1.0 normal with respect to NaOH, and containing 10% to 20% Na_2SO_4 by weight and 0.05 to 0.3 mole per liter of an organic base until a portion of the telpeptides is removed from the collagen molecules in said bundles,

(1) said bundles having a length greater than 5 mm when being soaked in said solution,

(2) a length of said bundles greater than 5 mm being maintained during said soaking;

(b) washing the soaked material with water;

(c) grinding the washed material until said fiber bundles have a length of 5 to 70 mm;

(d) tanning the ground fiber bundles; and

(e) comminuting the tanned fiber bundles in an aqueous medium at a pH of 2.0 - 4.0 or 9.0 to 11.0 until an aqueous dispersion of collagen fibers having a length of at least 2 mm is formed.

4,097,235

AUTOCLAVE AND AUTOCLAVE SYSTEM

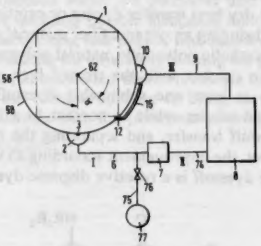
Hermann Stock, Neümunster, Germany, assignor to Firma Hermann Stock, Neümunster, Germany

Filed May 25, 1976, Ser. No. 689,914

Claims priority, application Germany, Jun. 5, 1975, 2524909

Int. Cl.[2] A23L 1/00, 3/14; A61L 3/00, 3/02

U.S. Cl. 21—93 17 Claims



1. An autoclave, for use in sterilizing articles and using a heated liquid as the sterilizing medium and which comprises

a vessel having a cylindrical shell, which has a horizontal central axis,

a row of outlet openings extending through said shell and communicating with the interior of said vessel, said outlet openings being spaced apart along the lowermost generatrix of said shell,

a row of inlet openings for supplying the heated liquid extending through said shell communicating with the interior of said vessel and spaced apart along a second generatrix of said shell, which second generatrix is angularly spaced about said shell from said lowermost generatrix by a central angle about the central axis of said shell in the range of 20° to 50°, and

means located exteriorly of said shell for receiving liquid from said outlet openings, for heating the liquid and for returning the heated liquid to said inlet openings for circulation within said shell.

4,097,236

METHOD OF DETECTING HEAT SEAL BREAKS AND PACKAGE THEREOF

William P. Daly, White Plains, N.Y.; Robert P. Lewis, Oceanport, N.J., and Oliver L. Pouliot, Oradell, N.Y., assignors to Faser Industries, Saddle Brook, N.J.

Filed Jan. 24, 1977, Ser. No. 762,066
Int. Cl.[2] B65D 73/00; G01M 3/00; G01N 19/08
U.S. Cl. 23—230 L 6 Claims

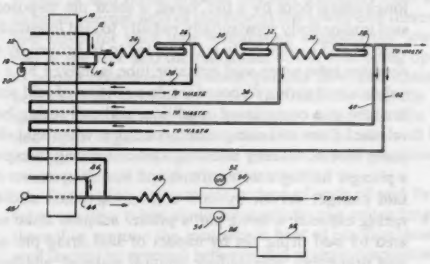
1. Method of detecting a break in a heat seal between a paper member and a clear plastic member in a sterilizable package which comprises providing a paper member dyed a dark color which is sufficiently porous to permit gas or steam sterilization but is impervious to bacteria, heat sealing the clear plastic member directly to the dyed paper member in the desired heat seal area, thereafter visually examining the heat seal to detect if the previously clear plastic member takes on a translucent appearance in the area of the heat seal which translucent appearance provides a distinct color contrast and indicates a broken seal.

4,097,237

DETERMINATION OF CELLS IN BLOOD

Bruce J. Oberhardt, Hartsdale, and Jack Olich, Mahopac, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Mar. 4, 1977, Ser. No. 774,560
Int. Cl.[2] G01N 21/02, 31/02, 31/22, 33/16
U.S. Cl. 23—230 B 11 Claims



1. A method for determining the volume of red cells in a blood sample comprising:

flowing along a conduit a predetermined volume of said sample;

introducing a known volume of an agglutinating agent and a predetermined volume of a dye into said conduit, said agglutinating agent being characterized by a relatively high positive charge, said dye being of a material not present in blood samples of the type being determined, said dye also being of known concentration and water soluble and characterized by (1) not penetrating said cells, (2) not forming a precipitate with said agglutinating agent or with soluble components of said sample, and (3) not lysing said cells or altering the volume of said cells;

mixing at least said sample and agglutinating agent while flowing along said conduit to agglutinate the red cells;

decanting the agglutinated red cells from said conduit; and

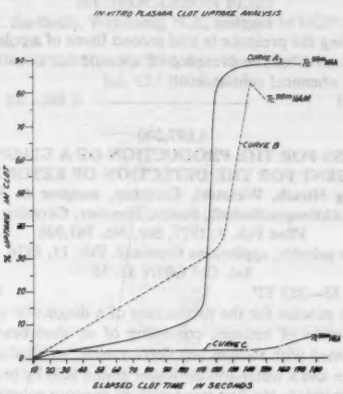
colorimetrically measuring the concentration of said dye in the plasma flowing along said conduit.

4,097,238

METHOD OF ANALYZING BLOOD PLASMA CLOTTING

Sheldon J. Ashley, 147-15 84th Rd., Jamaica, N.Y. 11355

Filed Jun. 3, 1977, Ser. No. 803,070
Int. Cl.[2] G01N 33/16
U.S. Cl. 23—230.3 8 Claims



1. A method of analyzing blood plasma clotting, comprising the steps of

citrating platelet-rich blood plasma;

adding a Tc^{99m} tagged particulate to the plasma;

counting the radioactivity of an aliquot of the citrated plasma with added particulate thereby providing the pre-clot count;

adding calcium chloride solution to initiate the clotting process;

adding an anticoagulant to the solution after the formation of a clot to terminate the clot reaction;

washing the residual clot in a normal saline solution;

resuspending the washed clot in a saline solution; and

recounting the radioactivity of the resuspended clot to provide the post-clot count and the clotting time.

4,097,239

TWO-FLAME BURNER FOR FLAME PHOTOMETRIC DETECTION

Paul L. Patterson, Walnut Creek, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

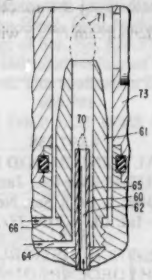
Filed Feb. 28, 1977, Ser. No. 772,710
Int. Cl.[2] G01J 3/48; G01N 31/12
U.S. Cl. 23—232 R 29 Claims

1. A method for analyzing a chemical substance, said method comprising the steps of:

introducing said chemical substance into a hydrogen-rich first flame,

passing combustion products and excess hydrogen from said first flame into a second flame via a conduit structure having a substantial thermal conductance such that said

conduit structure, in operation, does not contribute to the coloration of said second flame, and



detecting the presence in said second flame of a color that is indicative of the presence of a particular constituent in said chemical substance.

4,097,240

PROCESS FOR THE PRODUCTION OF A DIAGNOSTIC AGENT FOR THE DETECTION OF KETONES

Wolfgang Hirsch, Wunstorf, Germany, assignor to Riedel-de Haen Aktiengesellschaft, Seelze, Hanover, Germany

Filed Feb. 9, 1977, Ser. No. 767,028
Claims priority, application Germany, Feb. 11, 1976, 2605221
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—253 TP 6 Claims

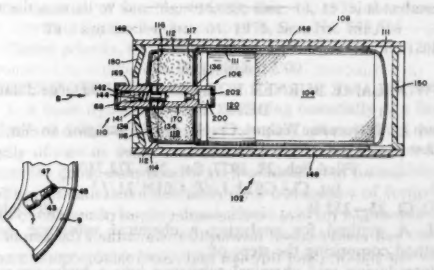
1. In a process for the production of a diagnostic agent for the detection of ketones, consisting of an absorbent carrier impregnated with sodium nitroferricyanide, an alkaline buffer substance and a water-soluble lower amino acid by impregnating the carrier in the first stage with an aqueous solution of the amino acid and tetrasodium ethylenediamine tetraacetate as buffer, drying the carrier, impregnating it in a second stage with a solution of sodium nitroferricyanide in a solvent mixture containing methanol as one component, and drying the carrier again, the improvement which comprises using a solvent mixture consisting of methanol and an organic solvent miscible with methanol which is not dimethyl formamide.

4,097,241

PYROTECHNIC TIRE INFLATOR

Eugene F. Garner, and Brian K. Hamilton, both of Canyon Country, Calif., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Nov. 4, 1974, Ser. No. 520,506
Int. Cl.[2] B01J *7/00*
U.S. Cl. 23—281 7 Claims



1. A light, portable, miniaturized tire inflator for inflating a tire without a source of stored gas, the tire having an inlet valve having a valve stem, the inflator adapted to fit in a limited space, such as in a tire well for a deflated space-saving tire in a trunk of an automobile, and adapted to be carried or held in one hand, comprising:

a pyrotechnic material to generate a low temperature, substantially non-toxic, tire-inflating gas upon combustion to inflate a tire; said pyrotechnic material including by weight: about 1% to about 5% of a fuel; about 40% to about 60% of an inorganic oxidizer; and about 35% to about 55% of a combined binder and coolant:

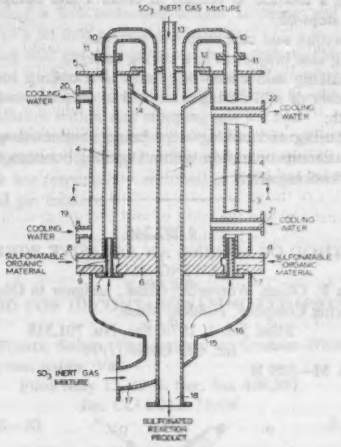
a pressure vessel exterior of a tire to hold said pyrotechnic material, said pressure vessel having a first end and a second end; said pressure vessel including a canister having a cylindrical shape, a first end corresponding to said first end of said pressure vessel and a second end corresponding to said second end of said pressure vessel, said first end of said canister being open and having an outer edge; and a canister cap, a portion of which is adapted to fit within the outer edge of said first end of said canister; said pyrotechnic material compacted in the shape of a cylinder and having a coating of an inhibitor on the outer surface of the pyrotechnic material between the pyrotechnic material and the walls of said canister and on an outer surface of an end of the pyrotechnic material, said inhibitor delaying burning of said outer surfaces of the pyrotechnic material; said canister cap including: a first place disposed within said canister cap and having apertures for permitting passage of said inflating gas; a coolant bed to cool the inflating gas as the gas passes through the coolant bed; and a second plate disposed in said canister cap, said second plate having apertures for permitting passage of said inflating gas; said coolant bed being disposed between said second plate and said first plate; said pressure vessel further including an over pressure relief means for release of excess pressure in the pressure vessel; and an ignitor mechanism located at said first end of said pressure vessel to ignite and cause said pyrotechnic material to burn; said ignitor mechanism including: an ignitor body having a substantially cylindrical shape and a longitudinal bore, said ignitor body extending through said canister cap and into a portion of said canister; an actuator tube having a downstream end and an upstream end, said actuator tube disposed within a portion of said longitudinal bore of said ignitor body, said actuator tube being movable within said longitudinal bore by a tire valve; a shear pin disposed in said ignitor body substantially radially to said longitudinal bore of said ignitor body and adapted to be broken by said actuator tube when said actuator tube is moved by a tire valve; a coil spring disposed inside a portion of said actuator tube in a compressed condition, said coil spring being released from said compressed condition when said shear pin is broken, thereby allowing said coil spring to expand; a plunger having a downstream end and an upstream end, said plunger driven by said coil spring when said coil spring expands; a firing pin; a primer adapted to be actuated by said firing pin by impact of said firing pin upon said primer; an intermediate ignition material, adapted to be ignited by said primer, and a main ignition charge adapted to be ignited by said intermediate ignition material, said main ignition charge adapted to cause combustion of said pyrotechnic material; and

a nozzle mounted on said first end of said pressure vessel, said nozzle being adapted to be connected directly to a tire valve, said nozzle having a downstream end and an upstream end, said nozzle including: a well at the downstream end of said nozzle, said downstream end of said nozzle having means to connect said nozzle directly to a tire valve; and a stem depressor for depressing a valve stem of a tire valve to allow inflating gas to pass through the valve into the tire, said stem depressor extending through a bore in the upstream end of the nozzle.

4,097,242
SULFONATION APPARATUS

Kelichi Tsuto; Kanji Majima, and Shigeyasu Imamura, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Division of Ser. No. 704,613, Jul. 12, 1976, Pat. No. 4,086,256.
This application Apr. 22, 1977, Ser. No. 789,873
Claims priority, application Japan, Jul. 21, 1975, 50-89069
Int. Cl.[2] C07C *143/24*; B01J *1/00*; F28D *7/12*
U.S. Cl. 23—283 7 Claims



1. An apparatus for reacting a liquid organic reactant with sulfur trioxide gas, comprising:

a plurality of individual, parallel, vertically positioned, hollow, cylindrical, first-stage reaction tubes, each of said tubes being of circular cross-section and each of said tubes having at the lower end thereof a central inlet for feeding a stream of a mixture of sulfur trioxide gas and inert gas upwardly into the central region of the tube at the lower end thereof and an outer annular inlet surrounding said central inlet and isolated therefrom for feeding an annular stream of said liquid organic reactant upwardly onto the circular internal wall of the tube at the lower end thereof, said inlets for each tube terminating adjacent the lower end of the tube and the remainder of the tube being open to permit concurrent, upward, parallel flow and contact between said streams to effect the reaction whereby in each of said reaction tubes an annular rising thin film of said liquid organic reactant is formed on the tube wall by said gas stream and the sulfur trioxide in said gas stream reacts with said liquid organic reactant;

means for cooling the external surface of each of said first-stage reaction tubes along substantially the entire length thereof to remove the exothermic heat of reaction generated therein by reaction between said organic reactant and said sulfur trioxide;

a single, vertically positioned, hollow, cylindrical, second-stage reaction tube of circular cross-section having an inlet at the upper end thereof, an outlet at the lower end thereof and means for cooling the external surface of said second-stage reaction tube along the length thereof to remove the exothermic heat of reaction generated therein;

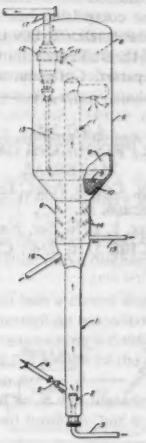
each of said first-stage reaction tubes having a conduit extending from the upper end thereof to the inlet of said second-stage reaction tube so that the entireties of the gas and liquid streams exiting from all of the first-stage reaction tubes are fed into the inlet of said second-stage reaction tube and are combined therein;

and a further inlet pipe extending to the central portion of the inlet of said second-stage reaction tube for supplying thereto an additional, downwardly flowing stream of a mixture of sulfur trioxide gas and inert gas, whereby the combined liquid streams from all of said first-stage reaction tubes form an annular falling thin film on the wall of said second-stage reaction tube and the sulfur trioxide gas in said additional stream reacts with previously unreacted liquid organic reactant to complete the sulfonation thereof.

4,097,243
HYDROCARBON-FEED DISTRIBUTOR OF INJECTING HYDROCARBON FEED

David B. Bartholic, Watchung, N.J., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 4, 1976, Ser. No. 738,991
Int. Cl.[2] B01J *8/18*
U.S. Cl. 23—288 S 16 Claims



1. A hydrocarbon-feed distributor for injecting a hydrocarbon-feed into contact with a fluidizable catalyst under conversion conditions in a lower end of a vertically disposed riser reactor conduit having a lower end, cylindrical inside and outside walls, a reception vessel, the upper portion of said conduit extending into said vessel, the lower end thereof extending below said vessel, a hydrocarbon-feed inlet means entering said conduit at said lower end and a regenerated-catalyst inlet means passing through said walls at a distance downstream from said hydrocarbon-feed inlet means, said distributor comprising:

(a) a truncated cone having a small-diameter end connected to said hydrocarbon-feed inlet means and a large diameter end;

(b) a circular plate fitted into said large-diameter end, said plate having one or more first holes and a plurality of second holes passing through said plate; and,

(c) one or more first nozzles having a first inlet means fitted into said first hole and an outlet means positioned to direct hydrocarbon-feed upwardly toward the axial center line of and into and through said riser reactor conduit; and,

(d) a plurality of second nozzles having second inlet means fitted into said second hole and having second outlet means positioned to direct hydrocarbon-feed downstream of said second outlet means and impinge against said inside wall.

4,097,244

PROCESS FOR REMOVING SULFUR FROM COAL

Emmett H. Burk, Jr., Glenwood; Jin S. Yoo, South Holland, and John A. Karch, Chicago, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Dec. 13, 1976, Ser. No. 749,952
Int. Cl.[2] C10L 9/10; C10B 57/00
U.S. Cl. 44—1 R 33 Claims

1. A process for reducing the sulfur content of coal comprising the steps of:
1. contacting coal particles with an aqueous solution of iron complexing agent, and an oxidant to preferentially oxidize at least a portion of the sulfur in the coal;
2. thermally treating the oxidized sulfur-containing coal at elevated temperatures to reduce the sulfur content of the coal; and
3. recovering coal particles of reduced sulfur content.

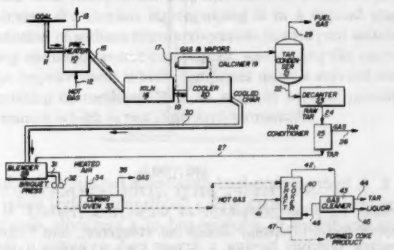
21. A process for reducing the sulfur content of coal comprising the steps of:
1. contacting coal particles with an aqueous solution of iron complexing agent, and an oxidant to preferentially oxidize at least a portion of the sulfur in the coal;
2. subjecting the oxidized sulfur-containing coal to a base thermal treatment comprising heating an aqueous slurry of the coal and base to elevated temperature to reduce the sulfur content of the coal; and
3. recovering coal particles of reduced sulfur content.

4,097,245

METHOD FOR PRODUCING CARBONACEOUS MATERIAL

Michael O. Holowaty, Crown Point, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Mar. 1, 1976, Ser. No. 662,449
Int. Cl.[2] C10L 5/16, 5/40; C10B 45/02
U.S. Cl. 44—23 25 Claims



1. In a method for producing a carbonaceous shape composed of carbonaceous material derived from particulized coal and a hydrocarbonaceous binder, wherein said method includes briquetting and coking steps, the additional steps comprising:
preheating said particulized coal in a preheating stage to a preheating temperature which drives off moisture without driving off volatile vapors and gases from said coal;
heating the preheated coal, in a single heating stage, from said preheating temperature to a temperature above 1400° F (760° C), to drive off volatile vapors and gases from said coal, without combusting said coal, and to produce a carbonaceous material;
and capturing the gases driven off during said heating step;
said heating step being conducted prior to said briquetting and coking step;
said heating step being conducted in the absence of extraneous gas so that said captured gases consist essentially of the volatile vapors and gases driven off from said coal undiluted with extraneous gas;
said method comprising a plurality of steps, including said above-recited steps, which cooperate to avoid producing a carbonaceous material having a size and shape characteristic of expansion without retraction.

4. In a method as recited in claim 1 and comprising:
removing said carbonaceous material from said heating stage;
and briquetting said carbonaceous material with a hydrocarbonaceous binder after its removal from said single heating stage;
no subsequent heating being performed after said heating step and prior to said briquetting step.

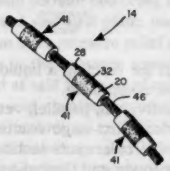
11. In a method as recited in claim 1 and comprising the further steps of:
briquetting said carbonaceous material;
curing said briquettes in a curing zone;
and coking said cured briquettes in a coking zone downstream of said curing zone and in communication therewith;
said curing and coking steps being conducted as a single continuous operation without cooling between the curing and coking steps.

4,097,246

METHOD OF MAKING AN ABRASIVE WIRE FOR SAWING STONE

Norman R. Olson, Worcester, Mass., assignor to Olson Manufacturing Company, Holden, Mass.

Filed Jul. 1, 1976, Ser. No. 701,518
Int. Cl.[2] C04B 31/16
U.S. Cl. 51—309 R 10 Claims



1. In a conventional method of making an abrasive wire for sawing stone, said conventional method comprising the following steps:
(a) forming a support element of malleable metal into a shape comprising two contiguous, axially aligned, cylindrical portions, the first portion having a larger diameter and the second portion having a smaller diameter;
(b) positioning the support element into the bore of a die, the bore having the same diameter as that of the first portion of the support element;
(c) inserting a quantity of abrasive powder containing a mixture including diamond grit and a sinterable metal binder into the bore of the die, the abrasive powder being positioned around the second portion of the support element;
(d) compressing the abrasive powder axially towards the first portion of the support element, a part of the second portion of the support element protruding axially beyond the compressed abrasive powder;
(e) sintering the abrasive powder to produce a solid abrasive body;
(f) affixing the solid abrasive body to the support element;
(g) forming a central axial bore through the support element;
(h) inserting a length of flexible wire rope through the support element bore; and
(i) affixing the support element to the wire rope; the improvement to said foregoing conventional method comprising: affixing the solid abrasive body to the support element by deforming the part of the second portion of the support element protruding axially beyond the compressed abrasive powder, said deformed second portion part having the same diameter as that of the first portion.

4,097,247
ISOTOPE SEPARATION PROCESS

James B. Anderson, Hamden, Conn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 10, 1972, Ser. No. 298,431
Int. Cl.[2] B01D *57/00*
U.S. Cl. 55—17 10 Claims

1. A method for the separation of species of different weight or different molecular size contained in a gas mixture, comprising the steps of:

introducing a low-molecular-weight stopping gas in the form of a jet into a vacuum chamber;

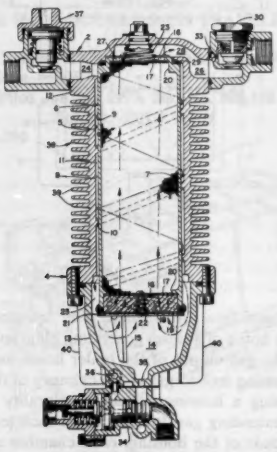
expanding said gas mixture through a nozzle to form a gas mixture jet directed to impinge upon said stopping gas jet to effect spatial separation of said different species of said gas mixture within said stopping gas jet; and

dividing said stopping gas jet downstream from the point of impingement of said gas mixture jet into separate streams which are respectively enriched in the separated species of said gas mixture.

4,097,248
METHOD FOR DECONTAMINATING COMPRESSED GAS

Virgil L. Frantz, Salem, Va., assignor to Graham-White Sales Corporation, Salem, Va.

Filed May 15, 1974, Ser. No. 469,957
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—33 3 Claims

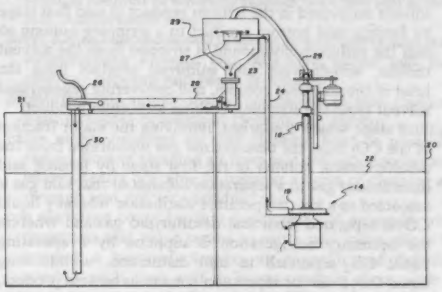


1. A method of adsorbing an entrained component from and cooling compressed gas supplied by a compressor during pumping cycles thereof, comprising containing in a heat conductive container a desiccant adapted to selectively adsorb said component, so passing said gas in a laterally confined path around said container as by partly converting kinetic energy of said gas into centrifugal force to concentrate heat from said gas and container on an outer confine of said path, externally dissipating said heat from said outer confine for cooling said gas and container and therethrough maintaining said desiccant in a temperature range of substantially optimum adsorption efficiency for said component, passing said cooled gas through said desiccant for adsorbing said component, and during idling cycles of said compressor discharging contaminants separated by said centrifugal force from said gas while preventing gas from said compressor from entering said confined path.

4,097,249
METHOD OF FLUID DEGASSING

Victor Quin Phillips; Phil Harmon Griffin, and Martin James Sharki, all of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 27, 1976, Ser. No. 754,853
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—41 10 Claims



1. A method of removing a substantial amount of entrained gas from a viscuous fluid such as drilling mud, said method comprising:

introducing the fluid into a fluid pump and pressurizing the introduced fluid;

discharging the pumped fluid through a conduit and into a spray vessel;

spraying the fluid outward from a deflector in the spray vessel in a 360° radial spray pattern having a central opening;

creating a vacuum in the spray vessel by said spraying step;

flowing the sprayed fluid into a discharge outlet of the spray vessel;

discharging said fluid into a closed degassing vessel;

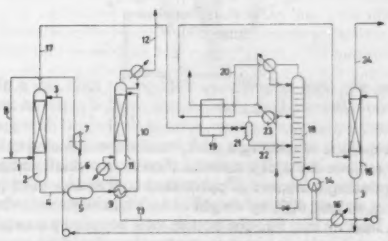
moving said fluid through an extended length of the degassing vessel while maintaining a fluidic barrier to gas flow between the extended length of the degassing vessel and the spray vessel; and,

discharging the fluid from the degassing vessel and collecting the gas removed from the fluid in the degassing vessel.

4,097,250
METHOD FOR THE PURIFICATION OF NATURAL GAS HAVING A HIGH CONTENTS OF ACIDIC GASES

Giorgio Pagani, Milan; Gianfranco Guerreri, and Bruno Peri, both of San Donato Milanese (Milan), all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Mar. 4, 1977, Ser. No. 774,626
Claims priority, application Italy, Mar. 5, 1976, 20900 A/76
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—48 8 Claims



1. The method of purifying natural gas having a high content of acidic gases, comprised of a sulfurous compound and CO_2, in a series of stages which include:

a first stage which comprises, desulfurizing the gas to be purified by feeding said gas and a selective solvent for said sulfurous compound to a desulfurization column so that the sulfurous compound is absorbed by said solvent, recovering the solvent and material absorbed thereby as bottom product from the desulfurization column and withdrawing desulfurized gas including natural gas and CO_2 from the head of the desulfurization column;

a second stage which comprises, regenerating the selective solvent recovered in the bottom product of said first stage by feeding said bottom product to a stripping column so that the sulfurous compound is stripped from the solvent therein, withdrawing said sulfurous product from the head of the stripping column, and recovering regenerated solvent from the stripping column as bottom product;

a third stage which comprises, removing the major fraction of the CO_2 from the desulfurized gas withdrawn from the desulfurization column in the first stage by feeding said desulfurized gas to a separation column so that said gas is subjected to a low temperature distillation whereby liquid CO_2 is separated from said desulfurized gas and wherein the necessary refrigeration is supplied by evaporating liquid CO_2 separated in said distillation, withdrawing liquid CO_2 from the separation column as bottom product, and recovering natural gas and the balance of the CO_2 from the head of the separation column;

a fourth stage which comprises, purifying the natural gas withdrawn from the head of the separation column in said third stage by feeding said head product from the third stage and said regenerated selective solvent recovered as bottom product in the second stage to an absorption column so that CO_2 in said third stage head product is absorbed by said regenerated selective solvent, recovering purified natural gas from the absorption column as head product, and withdrawing selective solvent and absorbed OO_2 from said absorption column as bottom product; and

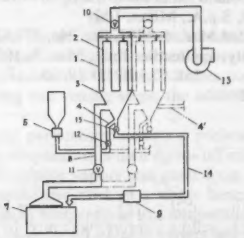
recycling said fourth stage bottom product to the first stage desulfurization column.

4,097,251

METHOD OF FILTERING A STICKY MATERIAL-CONTAINING EXHAUST GAS

Takao Murayama, Yokoyama; Seiichi Shimizu, Tokyo, and Takeo Miyakawa, Kawasaki, all of Japan, assignors to Taisei Kensetsu Kabushiki Kaisha & Tokyo Gas Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1977, Ser. No. 778,421
Claims priority, application Japan, Apr. 14, 1976, 51-41990
Int. Cl.[2] B01D *46/00*
U.S. Cl. 55—97 **8 Claims**



1. A method of treating a sticky material-containing exhaust gas to remove the sticky material therefrom, which comprises

introducing a mixture of pulverized coal and/or coke particles, at least 60% by weight of which have particle sizes of 0.3mm or less, into the bottom of a hopper by means of a supply pipe connected to the bottom of said hopper, said hopper being positioned below, and integrally connected with, a bag-house containing at least one bag-filter, to cause a vertical rotary flow of pulverized coal and/or coke particles in said hopper and to gradually deposit and form a protective layer of pulverized coal and/or coke having a minimum thickness of at least 1.0mm on the surface of each bag-filter, and

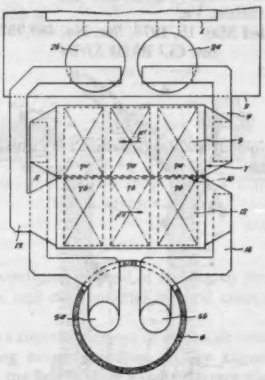
introducing the sticky material-containing exhaust gas into said hopper in a manner such that the gas passes through said protective layer while said protective layer captures and retains the sticky material.

4,097,252

ELECTROSTATIC PRECIPITATOR

Franz-Josef Kirchhoff, Olpe, and Joachim Brandt, Rothemuhle, both of Germany, assignors to Apparatebau Rothemuhle Brandt & Kritzler, Rothemuhle, Germany

Filed Apr. 5, 1976, Ser. No. 673,589
Claims priority, application Germany, Apr. 5, 1975, 2514956
Int. Cl.[2] B03C *3/01*
U.S. Cl. 55—135 **12 Claims**

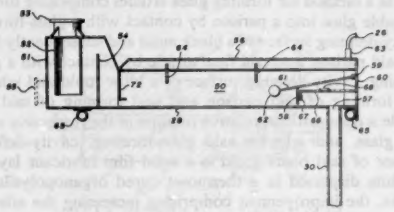


7. A horizontal-flow electrostatic filter interconnected between a boiler house of a steam generating plant and a chimney for treating the gas output of the boiler house and including ducting for passing treated gas to the chimney of the plant, the filter comprising a housing defining a plurality of separate horizontally extending gas-flow chambers each terminating at longitudinal ends of the housing, each chamber containing a plurality of arrays of collection and discharge electrodes which define a plurality of electrostatic precipitation fields arranged in series for the passage therethrough sequentially of gas in each chamber in parallel directions, input duct means for each chamber for bringing the gas output of the boiler house to the chambers and dividing it among them, said input duct means being at one longitudinal end of the housing for one of the chambers and at the other longitudinal end of the housing for another of the chambers, and output duct means for bringing the treated gas from the chambers to be reunited in the chimney, output duct means for the one of the chambers being at the other longitudinal end of the housing and output duct means for the other of the chambers being at the one end of the housing whereby the directions of glow through the chambers are parallel and opposite and the gas output of the boiler house is treated in a plurality of substantially equal streams totalling the said output, one stream to each chamber.

4,097,253
MUD DEGASSER TROUGH

Victor Quin Phillips; Phil Harmon Griffin, and Martin James Sharki, all of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 27, 1976, Ser. No. 754,855
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—169 11 Claims

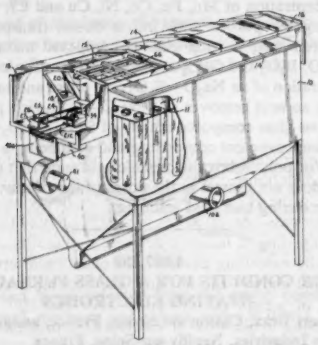


1. A degassing trough for removing gas bubbles entrained in viscuous fluids such as drilling mud, said trough comprising:
an enclosed inlet section having an inlet opening therein;
a flow section connected to said inlet section and being relatively airtight;
a restricted flow opening between said inlet and flow sections arranged to maintain a liquid barrier against open communication of gas between said two sections;
gas discharge means in said flow section; and,
fluid discharge means in said flow section.

4,097,254
BAGHOUSE WITH DOUBLE PASS TRAVELING PURGE HEAD

Richard D. Noland, 1900 W. 47th Pl., Suite 308, Shawnee Mission, Kans. 66205

Filed Jun. 13, 1977, Ser. No. 806,188
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—294 10 Claims

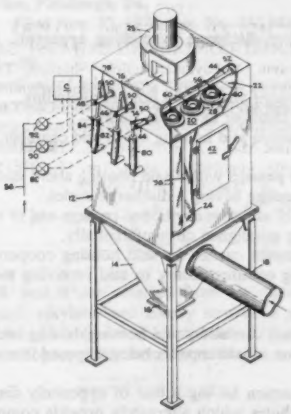


1. Apparatus for separating particulate matter from a gas stream, said apparatus comprising:
a housing;
a substantially horizontal partition disposed interiorally of said housing, thereby defining a first chamber above said partition and a second chamber beneath said partition, said partition having a plurality of openings therethrough;
an inlet conduit connected to said second chamber for directing a particulate laden gas stream into said second chamber;
an outlet conduit communicating with said first chamber to exhaust gas therefrom;
a plurality of filters disposed in said second chamber and having open ends secured to said openings through said partition, said filters being arranged in two parallel, spaced apart banks;
a plurality of vertical dividers arranged in said first chamber above said two banks of filters to thereby define compartments having mouths opening centrally of said first chamber;
a movable cleaning head disposed within said first chamber between said banks of filters and having an air delivery conduit adapted to matingly register with and seal against said compartment mouths;
drive means coupled to said cleaning head to move said head longitudinally forward and backward within said first chamber between said banks of filters;
pressurized air supply means connected to said cleaning head to supply pressurized cleaning air thereto;
valve means mounted on said cleaning head to normally restrict flow of cleaning air from said delivery conduit and intermittently operable to transmit a burst of cleaning air through said delivery conduit; and
can discharge control means positioned and arranged with respect to said valve means to cause said valve means to transmit a burst of cleaning air through said delivery conduit each time said delivery conduit aligns with a compartment mouth of one bank of filters as said cleaning head travels through said first chamber in one direction and to cause said valve means to transmit a burst of cleaning air through said delivery conduit each time said delivery conduit aligns with a compartment mouth of the second bank of filters as said cleaning head travels through said first chamber in the opposite direction.

4,097,255
GAS FILTER CLEANING APPARATUS

Alfonso A. Samolis, 329 Carnaritas Way, Danville, Calif. 94526

Filed Apr. 4, 1977, Ser. No. 784,154
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—294 3 Claims



1. In a gas filter of the type including at least one porous element having a hollow interior and a circular outlet communicating with the hollow interior, means for directing contaminated gas to the exterior of said element for flow radially through said element, into the interior and means communicating with the outlet for conducting filtered gas therefrom, improved apparatus for periodically producing a reverse blast to dislodge contaminates from the exterior of said element comprising a nozzle, means for supporting said nozzle adjacent said outlet for pivotal movement about an axis spanning the outlet between an active position at which the nozzle is directed toward said interior and a passive position at which the nozzle is pivoted about said axis away from said outlet, a venturi

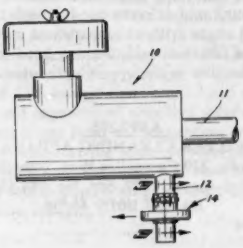
having an opening aligned with said nozzle, means for mounting said venturi to said supporting means for pivotal movement in unison with said nozzle, said venturi including a substantially impervious member having a marginal portion substantially congruent to said outlet so as substantially to seal said outlet when in said active position, said marginal portion having a radius of curvature relative to said axis to afford movement of said venturi between said active and passive positions, said venturi defining a central opening substantially coaxial with said nozzle, and a sleeve portion surrounding said central opening and extending toward said outlet, said sleeve portion terminating in an orifice disposed radially inward of said marginal portion to avoid interference of movement of said venturi between said active and passive positions, and means for supplying compressed gas to said nozzle in the active position.

4,097,256

POWERED CONTAMINANT DISCHARGE EVACUATOR IN CONNECTION WITH AIR CLEANER

Lewis A. Borsheim, Fargo, N. Dak., assignor to Melroe Industries, Inc., Fargo, N. Dak.

Filed May 20, 1977, Ser. No. 798,857
Int. Cl.[2] B01D *41/00*
U.S. Cl. 55—429 **9 Claims**



1. A positive discharge evacuating apparatus, having in combination

a housing,

receiving means within said housing including,

an annular chamber having an outlet,

a passage within said housing about said chamber having an outlet,

a discharge passage within said housing about said last mentioned passage having a discharge outlet,

said outlet of said first mentioned passage and of said chamber being misaligned circumferentially,

discharge means carried by said housing cooperating with and being complementary to said receiving means comprising,

an impeller,

driving means carried by said housing driving said impeller,

a hub portion of said impeller being disposed into said chamber,

said hub portion having a pair of oppositely disposed discharge chutes which alternately provide communication between said chamber and said discharge passage,

vanes carried by said impeller upstanding therefrom disposed in said first mentioned passage,

a plurality of vanes carried by said impeller upstanding therefrom disposed in said discharge passage,

a pair of opposed spaced pairs of said vanes in said first mentioned passage define pockets respectively alternately in register with said outlet of said chamber, and

said other vanes of said other mentioned passage and said vanes of said discharge passage obstructing communication between said outlet of said chamber and said outlet of said discharge passage when one of said discharge chutes of said chamber communicates with said discharge passage.

4,097,257

GLASS MOLDING PROCESS WITH MOLD LUBRICATION

Richard G. Davey, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 563,895, Mar. 31, 1975, abandoned.
This application Oct. 12, 1976, Ser. No. 731,591
Int. Cl.[2] C03B *39/00*
U.S. Cl. 65—26 **5 Claims**

1. In a method for forming glass articles comprising forming formable glass into a parison by contact with a glass-forming, cavity-defining surface of a blank mold and subsequently forming said parison into said final article by contact with a glass-forming, cavity-defining surface of a blow mold and wherein said forming of said parison and said forming of said final article is done without relative rotation of the respective molds and glass, and wherein said glass-forming, cavity-defining, surface of said blank mold is a solid film lubricant layer of graphite dispersed in a thermoset cured organopolysiloxane binder, the improvement comprising increasing the effective glass forming life of said layer by spraying onto said solid film lubricant layer prior to glass formation effective lubricating amounts of a mixture comprising lubricating oil and effective lubricating amounts of graphite said mixture containing about 0.34% to about 6.8% by weight of said graphite.

4,097,258

OPTICAL FIBER

Susumu Horikawa, Fussa; Kenji Nakagawa, Tokorozawa, and Yoshito Nogami, Saitama, all of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Continuation of Ser. No. 578,785, May 19, 1975, abandoned.
This application Jun. 16, 1976, Ser. No. 696,657
Claims priority, application Japan, May 17, 1974, 49-55207
Int. Cl.[2] C03C *13/00, 15/00*
U.S. Cl. 65—31 **4 Claims**

1. In a method for preparing the core glass of an optical fiber comprising:

heat treating a starting glass to cause phase separation,

leaching with an acid to obtain a porous glass with low concentration of Mn, Fe, Co, Ni, Cu and Cr, and

sintering the porous glass into a dense, transparent glass, wherein said starting glass is composed mainly of SiO_2, Na_2O, B_2O_3 and GeO_2 and said heat-treating causes phase separation of an Na_2O—B_2O_3 rich phase and said leaching with an acid removes said Na_2O—B_2O_3 rich phase and a porous glass composed mainly of SiO_2—GeO_2 is obtained; the improvement comprising said acid being a polyhydric and/or polycarboxylic organic acid such that undissolved Ge does not remain in the pores of the porous SiO_2 GeO_2 glass during said acid leaching.

4,097,259

FEEDER CONDUITS FOR A GLASS FURNACE WITH HEATING ELECTRODES

Jean Albert Brax, Chalon sur Saone, France, assignor to Saint Gobain Industries, Neuilly-sur-Seine, France

Filed Sep. 16, 1977, Ser. No. 833,956
Claims priority, application France, Oct. 29, 1976, 76 32789
Int. Cl.[2] C03B *5/02*
U.S. Cl. 65—327 **20 Claims**

1. Apparatus for conveying molten glass from a forehearth to a glass forming machine comprising:

a. an elongated conduit having an inlet connected to the forehearth for reception of molten glass therefrom;

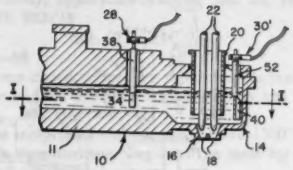
b. a bowl-shaped container having an inlet communicating with said elongated conduit for reception of molten glass therefrom, said container having in its bottom an orifice for withdrawing the molten glass therefrom;

c. a vertical cylinder disposed within the container and above the orifice, said cylinder and a side wall of the container opposite the inlet of the container defining a

semi-annular channel therebetween, said cylinder being rotatable about its longitudinal axis for stirring the molten glass and effecting a flow of glass through said semi-annular channel;

d. a first electrode inserted in the molten glass upstream of said cylinder and substantially extending through the entire height of the molten glass;

e. a second electrode inserted in the molten glass within the



semi-annular channel and substantially extending through the entire height of the molten glass, said first and second electrodes being offset from a vertical plane passing through the center of said elongated conduit and the center of said cylinder; and

f. means for energizing said first and second electrodes to produce an electric current flow through the molten glass between said electrodes to heat the molten glass therebetween.

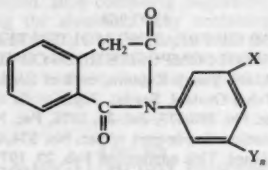
4,097,260

2-SUBSTITUTED-1,3(2H,4H)-ISOQUINOLINEDIONES AS PLANT GROWTH REGULANTS

John J. D'Amico, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 28, 1975, Ser. No. 636,012
Int. Cl.² A01N 9/22
U.S. Cl. 71—94 **5 Claims**

1. A method of regulating the growth of leguminous plants which comprises treating said plants with an effective nonlethal amount of a compound having the formula



wherein X and Y are selected from the group consisting of trifluoromethyl, methoxy and chloro; and *n* is 0 or 1.

4,097,261

METHOD AND COMPOSITIONS FOR CONTROLLING WATERHYACINTH

Kenneth Edward Conway; Thomas Edward Freeman, and Raghavan Charudattan, all of Gainesville, Fla., assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 13, 1977, Ser. No. 796,565
Int. Cl.² A01N 9/00
U.S. Cl. 71—66 **10 Claims**

1. A mycoherbicide concentrate for the preparation of compositions effective to control waterhyacinth, said concentrate comprising: the microorganism *Cercospora rodmanii* Conway adsorbed on an agronomically acceptable carrier.

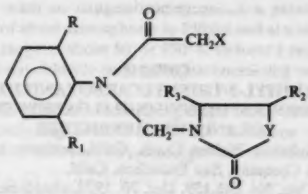
4,097,262

HERBICIDAL ACETAMIDES

Jiin-Duey Cheng, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 22, 1977, Ser. No. 789,961
Int. Cl.² A01W 9/12, 9/22; C07D 236/04, 277/04
U.S. Cl. 71—90 **40 Claims**

1. A compound of the formula



where

R is alkyl or alkoxy of 1 to 4 carbon atoms;

R_1 is hydrogen or alkyl of 1 to 3 carbon atoms:

R_2 is hydrogen or methyl;

R_3 is hydrogen or methyl;

X is chlorine or bromine; and

Y is oxygen or sulfur.

11. A composition for the control of undesirable vegetation consisting essentially of a herbicidally effective amount of a compound of claim 1 and at least one of (a) a surface-active agent and (b) a solid or liquid diluent.

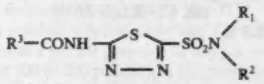
4,097,263

5-ACYLAMINO-1,3,4-THIADIAZOLE-2-SULFONAMIDES AND USE AS HERBICIDES

Joel L. Kirkpatrick, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Nov. 22, 1976, Ser. No. 743,543
Int. Cl.² A01N 9/16; C07D 91/62
U.S. Cl. 71—90 **3 Claims**

1. The method of selectively combating unwanted vegetation in the presence of crop plants comprising applying pre- or post-emergently an effective amount of compound having the structural formula



in which R^1 and R^2 are selected from hydrogen and lower alkyl, alkenyl, alkylene and alkoxy structures and together possess a total of 1 to 6 carbon atoms when R^3 is ethyl, propyl, isopropyl, cyclopropyl, methoxy or tert-butyl.

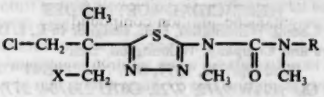
4,097,264

CHLORO-TERT.BUTYL-1,3,4-THIADIAZOLEUREA HERBICIDES AND USE TO COMBAT UNWANTED VEGETATION

Joel L. Kirkpatrick, Overland Park, and Jr. Doyle, Leawood, both of Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed May 14, 1973, Ser. No. 360,204
Int. Cl.² A01N 9/12
U.S. Cl. 71—90 **2 Claims**

1. The method of combating unwanted vegetation comprising the step of applying to the area in which the vegetation is unwanted an effective amount of a compound having the structural formula



in which X is H and R is CH_3.

4,097,265

3,5-DIMETHYL-2-THIENYLCARBOXANILIDE AND 3,5-DIMETHYL-2-THIENYL-(N-HALOALKYLTHIOCARBOXANILIDE) HERBICIDES

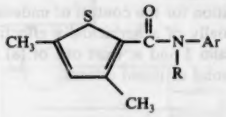
John W. Kobzina, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 645,159, Dec. 30, 1975, abandoned, which is a continuation of Ser. No. 570,339, May 21, 1975, Pat. No. 3,948,633, which is a division of Ser. No. 383,751, Jul. 30, 1973, Pat. No. 3,892,775. This application Jan. 31, 1977, Ser. No. 764,125

Int. Cl.² A01N 9/12; C07D 63/16

U.S. Cl. 71—90 **9 Claims**

1. A compound of the formula



wherein R is hydrogen and Ar is phenyl or 2-fluorophenyl.

4,097,266

MICROSPHERE OF SOLDER HAVING A METALLIC CORE AND PRODUCTION THEREOF

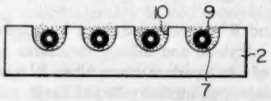
Eikichi Takahashi, Matsudo; Toshihiko Taguchi, Showa; Kazuo Fujikura, Mooka, and Toshihisa Sudo, Tokyo, all of Japan, assignors to Senju Metal Industry Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1975, Ser. No. 645,395

Claims priority, application Japan, Jan. 24, 1975, 50-10223

Int. Cl.² B22D 23/08

U.S. Cl. 75—0.5 R **16 Claims**



1. A microsphere of solder comprising a metallic core grain and a solder coating thereon, which is prepared by melting at least one solder grain at a temperature higher than the melting point of the solder grain but lower than the melting point of the metallic core grain, and in the presence of the metallic core grain and a flux, to envelop the metallic core grain with a solder coating, the thickness of the solder coating being more than 20 microns.

5. A process for producing a microsphere of solder comprising a metallic core grain and a solder coating thereon, comprising preparing a predetermined number of solder grains and a metallic core grain, heating the grains in the presence of a flux at a temperature higher than the melting point of the solder grains, but lower than the melting point of the metallic core grain to envelop the metallic grain with a coating of solder.

4,097,267

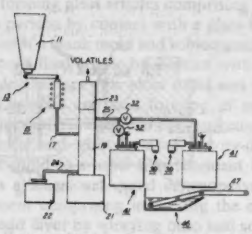
PURIFICATION AND REALLOYING OF ARSENIC/SELENIUM ALLOYS

Gary P. Baccaro, Fairport, and James F. Seitz, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 5, 1977, Ser. No. 812,869

Int. Cl.² B22D 23/08

U.S. Cl. 75—0.5 B **8 Claims**



1. A method for the reclamation of arsenic containing selenium scrap which comprises:

(a) feeding the scrap to a premelter and heating it to a temperature sufficiently high to cause its liquefaction;

(b) feeding the melted scrap into a fractional distillation column to thereby repeatedly vaporize and condense the arsenic/selenium;

(c) removing low boiling impurities from the scrap in the fractional distillation column and recovering substantially pure liquid selenium from the column;

(d) providing a liquid arsenic/selenium master alloy containing from about 10 to 20% arsenic, said alloy having been prepared by the vapor/liquid combination of arsenic and selenium in the proper proportions;

(e) combining the liquid arsenic/selenium master alloy with the liquid selenium obtained from the fractional distillation column in the proportion required to form a new arsenic/selenium alloy containing the desired amount of arsenic;

(f) shotting the new arsenic/selenium alloy into a non-reactive liquid medium to form discrete solid particles of said alloy.

4,097,268

METHOD OF TREATING MOLTEN FERROUS MATERIAL WITH COMPOSITE RODS CONTAINING CA

Tohei Ototani, and Yasuji Kataura, both of Sendai, Japan, assignors to Tohei Ototani, Sendai, Japan

Division of Ser. No. 598,477, Jul. 23, 1975, Pat. No. 4,035,892, which is a continuation-in-part of Ser. No. 374,431, Jun. 28, 1973, abandoned. This application Feb. 29, 1977, Ser. No. 771,701

Claims priority, application Japan, Jun. 30, 1972, 47/65757; Dec. 27, 1972, 48/1615

The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.

Int. Cl.² C21C 7/02, 7/06

U.S. Cl. 75—57 **4 Claims**

1. A method for treating molten metal which comprises feeding a compressed and deformed composite calcium clad material of a solifified core encased in a sheath continuously to the bottom of a molten metal bath, said composite clad material consisting of

1. a core consisting essentially of

A. a material selected from the group consisting of metallic calcium, calcium aluminum alloy and mixtures thereof, and

B. at least one element selected from the group consisting of aluminum and rare earth metals encased in

2. a sheath of iron or alloy thereof, the core being 10–90% by weight based on the composite material, said clad material

having been subjected to mechanical compression and deformation prior to being fed into the molten bath.

4,097,269

PROCESS OF DESULFURIZING LIQUID MELTS

Wolfgang Holzgruber, Bruck an der Mur, Austria, assignor to INTECO Internationale Technische Beratung Gesellschaft m.b.H., Bruck an der Mur, Austria

Continuation of Ser. No. 645,326, Dec. 30, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 753,017

Claims priority, application Austria, Jan. 14, 1975, 245/75; Feb. 10, 1975, 993/75

Int. Cl.[2] C21C *7/02*

U.S. Cl. 75—58 10 Claims

1. A process characterized by rapid desulfurization of steel melts whose oxygen available for reaction is less than 0.01% comprising:

raising the temperature of the melt above 1500° C;

injecting a desulfurizing slag into the melt by means of a non-oxidizing carrier gas;

said slag being in a finely divided state and having been prepared by mixing, on a percent weight basis, 10 to 60% CaO, 10 to 70% CaF_2, 0 to 40% Al_2O_3, a maximum of 20% SiO_2 and a maximum of 5% heavy metal oxides, melting the mixture and then cooling the melt to prepare a prefused slag and then comminuting the prefused slag into the finely divided state, said slag having a liquidus temperature such that the particles thereof become liquid at a temperature at least 150° C below that of the steel melt and the particles of the slag being sufficiently small such that they become liquid substantially immediately on contacting the melt;

the injection being carried out in a manner to produce a fine dispersion of the slag particles in the melt.

4,097,270

REMOVAL OF MAGNESIUM FROM AN ALUMINUM ALLOY

Mannige Vikram Rao, Princeton Junction; Bernard H. Coyle, Jr., Voorhees, and Peter C. J. Gallagher, Hightstown, all of N.J., assignors to N L Industries, Inc., New York, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,185

Int. Cl.[2] C22B *21/06*

U.S. Cl. 75—68 R 23 Claims

1. A process for reducing the amount of magnesium metal from an aluminum alloy containing magnesium which comprises reacting the aluminum alloy containing magnesium metal with silica having a chemically reduced surface layer to form silicon metal which dissolves in the aluminum alloy and magnesium oxide, and removing the magnesium oxide from said aluminum alloy.

4,097,271

HYDROMETALLURGICAL PROCESS FOR RECOVERING COPPER AND OTHER METAL VALUES FROM METAL SULPHIDES

Godefridus M. Swinkels, Rossland; Edward F. G. Milner, Warfield, and Roman Michael Genik-Sas-Berezowsky, Edmonton, all of Canada, assignors to Cominco Ltd., Vancouver and Sherritt Gordon Mines Limited, Toronto, both of, Canada

Filed Nov. 12, 1976, Ser. No. 741,280

Claims priority, application Canada, Dec. 11, 1975, 241806

Int. Cl.[2] C22B *15/08, 11/04*

U.S. Cl. 75—104 19 Claims

1. A process for the recovery of non-ferrous, ferrous and precious metal values and sulphur from concentrates containing metal sulphides which comprises the steps of:

(1) subjecting said concentrates to a leach at a temperature in the range of about 80° to 110° C under autogenous pressure with lixiviant containing ferric chloride, cupric chloride and chlorine to form a leach solution containing cuprous chloride and a leach residue;

(2) treating said leach solution with gaseous butadiene at a temperature in the range of about −35° to +40° C under autogenous pressure to form a precipitate of cuprous chloride-butadiene addition compound and residual solution;

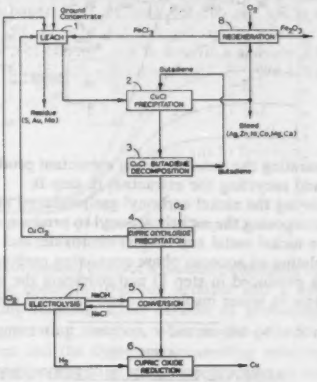
(3) decomposing precipitated addition compound at a temperature of up to about 80° C. at atmospheric pressure for the separate recovery of cuprous chloride and butadiene;

(4) returning recovered butadiene to step (2);

(5) slurrying recovered cuprous chloride and treating the slurry with an oxygen-bearing gas at a pressure in the range of about atmospheric to 250 psi and at a temperature in the range of about 50° to 150° C to form a precipitate of cupric oxychloride and a solution containing cupric chloride;

(6) returning solution containing cupric chloride to step (1);

(7) electrolyzing brine solution for formation of sodium hydroxide solution, hydrogen gas and chlorine gas;



(8) converting precipitated cupric oxychloride to cupric oxide and brine solution with an approximately stoichiometric amount of formed sodium hydroxide solution at a temperature in the range of about 80° C to the boiling point of the reaction mixture, under autogenous pressure, to give a final pH in the range of 7 to 11;

(9) returning brine solution to step (7);

(10) reducing cupric oxide to metallic copper with formed hydrogen gas;

(11) passing formed chlorine gas to step (1);

(12) treating residual solution from step (2) with an oxygen-bearing gas at a partial pressure of oxygen in the range of from about 100 to 200 psi and at a temperature in the range of from about 135° to 165° C for the regeneration of ferric-chloride and the simultaneous precipitation of anhydrous ferric oxide; and

(13) returning regenerated ferric chloride to step (1).

4,097,272

WINNING NICKEL AND COBALT WITH MERCAPTIDE EXTRACTANTS AND CARBON MONOXIDE STRIP

Alkis S. Rappas, Bedford, and J. Paul Pemsler, Lexington, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Sep. 8, 1977, Ser. No. 831,502

Int. Cl.[2] C22B *23/04;* C01G *51/02, 53/02;* C07C *149/00*

U.S. Cl. 75—119 18 Claims

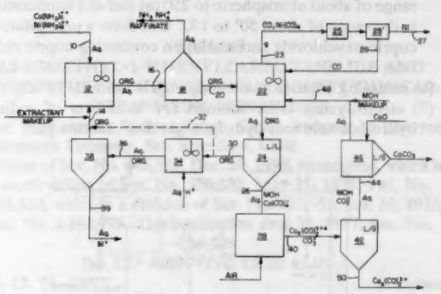
16. A process for separating cobalt and nickel values from an aqueous solution containing ions of said metals, said process comprising the steps of:

A. providing an extractant comprising a water immiscible organic solvent containing solubilized mercaptide anion capable of reacting with cobalt and nickel to form water insoluble mercaptides;

B. contacting the extractant with the aqueous solution to produce a mixture of cobalt mercaptide and nickel mercaptide in said extractant;

C. separating the aqueous raffinate solution resulting from step B from the mercaptide loaded extractant;

D. contacting the extractant containing the mercaptides with an aqueous alkaline solution and carbon monoxide to strip cobalt and nickel values therefrom and to produce gaseous $Ni(CO)_4$ and a water soluble salt of carbonyl cobaltate;



E. separating the metal depleted extractant produced in step D and recycling the extractant to step B;

F. isolating the nickel carbonyl gas produced in step D and decomposing the nickel carbonyl to produce substantially pure nickel metal and carbon monoxide; and

G. isolating an aqueous phase containing carbonyl cobaltate salts produced in step D and oxidizing the carbonyl cobaltate to water insoluble cobalt carbonyl compounds.

4,097,273

ARSENIC/SELENIUM RECOVERY

Wolfgang H. H. Gunther, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 5, 1977, Ser. No. 794,282
Int. Cl.² C22B *33/00*
U.S. Cl. 75—121 **10 Claims**

1. A method for the recovery of arsenic/selenium alloys which comprises:

a. dissolving an arsenic/selenium alloy containing from about 2 to about 36 weight percent arsenic in an aqueous solution of morpholine, piperidine or a primary or secondary amine of the formula:

$$R_2-\underset{\displaystyle R_1}{\underset{|}{N}}-H$$

wherein R_1 is an aliphatic group containing from 1 to 4 carbon atoms and R_2 is either H or an aliphatic group containing from 1 to 4 carbon atoms, and

b. evaporating the resulting solution to dryness to thereby recover the arsenic/selenium alloy.

4,097,274

METHOD OF MAKING SUPERHARD ARTICLES

Valentin Nikolaevich Bakul, ulitsa Kirova 34a, kv. 12; Igor Ivanovich Bilyk, ulitsa Radomyshlskaya 32, korpus 2, kv. 60; Dolores Khaimovna Bronshtein, ulitsa Scherbakova 45, kv. 8; Ivan Fedorovich Vovchanovsky, ulitsa Bulvar Lesi Ukrainki 5, kv. 119, and Nekhemian Veniaminovich Tsypin, ulitsa Dorogozhitskaya 26, kv. 59, all of Kiev, U.S.S.R.

Continuation of Ser. No. 519,273, Oct. 30, 1974, abandoned. This application May 19, 1976, Ser. No. 688,002
Int. Cl.² B22F *1/04*
U.S. Cl. 75—201 **2 Claims**

1. A method of producing a superhard article comprising the steps of: charging a mixture of diamond grains less than 1 mm in size and a hard-alloy matrix material into a graphite press mould with the diamond grains being evenly distributed throughout the hard-alloy matrix material; heating the mixture under a pressure of from 50 to 100 kg/cm² to 1,200° C at a rate of from 1,000° to 1,100° C per minute by passing high frequency currents through the press mould; maintaining the mixture in the press mould at 1,200° C for less than 2 minutes to preclude graphitization and dissolution of the diamond grains; heating the mixture under a pressure of from 100 to 200 kg/cm² to a sintering temperature less than 1,800° C at a rate of from 3,000° to 10,000° C per minute by simultaneously passing a current through the mixture and passing high frequency currents through the press mould; and maintaining the mixture in the press mould at the sintering temperature for a period of from 2 to 3 seconds.

4,097,275

CEMENTED CARBIDE METAL ALLOY CONTAINING AUXILIARY METAL, AND PROCESS FOR ITS MANUFACTURE

Erich Horvath, Friedrich-Eckkard-Str. 21, 8 Munich 81, Germany

Continuation of Ser. No. 376,354, Jul. 5, 1973, abandoned. This application May 5, 1976, Ser. No. 683,305
Int. Cl.² B22F *3/12*
U.S. Cl. 75—203 **11 Claims**

1. A process for making a sintered carbide-metal alloy containing submicronic carbide particles comprising the steps of:

forming a mixture of a carbide-forming charge selected from the group consisting of the dimetallic carbides, hydrides, eta carbides and elemental metals of groups 4a, 5a and 6a of the periodic table and their mixtures and a binding metal powder selected from the group consisting of iron, cobalt, nickel and their mixtures;

converting said carbide-forming charge to a carbide or carbides having a crystal structure different than the crystal structure of the carbide-forming charge by subjecting the carbide-forming charge-binder metal mixture to a gaseous carbon containing carburizing atmosphere at a temperature of 700 to 1100° C; and

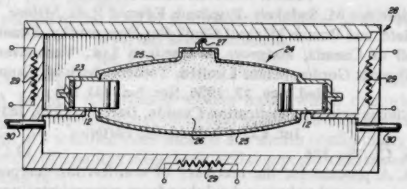
liquid-phase sintering the thus formed carbide-binder metal to wet and split the carbide to form submicronic carbide particles.

4,097,276

LOW COST, HIGH TEMPERATURE TURBINE WHEEL AND METHOD OF MAKING THE SAME

Lyle D. Six, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 17, 1975, Ser. No. 596,695
Int. Cl.² B22F *3/00, 3/14*
U.S. Cl. 75—208 R **4 Claims**



1. A method of manufacturing turbine wheels of the type having a plurality of blades radiating from a central hub comprising the steps of:

a. providing a ring of alternately arranged blades and spacers, said blades being preformed with each having a foot portion projecting into the central region of the ring and

with shoulder surface areas on said foot portions facing outwardly from the central region;

b. securing the blades and spacers together to retain them in ring forming order;

c. substantially completely enclosing the assembly of blades, spacers, and securing means in a heat softenable container;

c. filling the central region around the foot portions of the blades with a powdered heat softenable material;

e. evacuating and sealing the container;

f. heating the container and contents to soften the container and the powdered material; and

g. applying isostatic pressure to the exterior of the container inwardly to collapse the container from substantially all sides and to compact the heated powdered material therein into a unitary mass around and completely enveloping the foot portions of the blades to form inwardly facing shoulders of the compacted heated powdered material opposite to and interlocking with the shoulder surface areas of said foot portions to intersecure the blades and the compacted heated powdered material.

4,097,277

PHOTOSENSITIVE MEMBER HAVING LAYER OF VINYL CARBAZOLE POLYMER CONTAINING ANTIMONY CHALCOGEN COMPOUND OF ANTIMONY AND SULFUR

Yoshio Takasu, Tokyo, and Eiichi Kondo, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 436,747, Jan. 25, 1974, abandoned. This application Dec. 13, 1976, Ser. No. 749,974

Claims priority, application Japan, Jan. 31, 1973, 48-13140

Int. Cl.[2] G03G *5/06*

U.S. Cl. 96—1.5 R **14 Claims**

1. An electrophotographic photosensitive member comprising an electrically-conductive substrate and a photoconductive layer which consists essentially of an organic photoconductive polymer selected from the group consisting of homopolymers of at least one vinylcarbazole monomer and copolymers thereof containing more than 50% of the vinylcarbazole monomer, said polymer having dispersed therein from 1 to 30 parts by volume, per 100 parts by volume of said polymer, of an antimony chalcogen compound consisting essentially of antimony and sulfur.

4,097,278

REDOX AMPLIFICATION PROCESS EMPLOYING A COMBINATION OF OXIDIZING AGENTS

Vernon L. Bissonette, Brockport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 609,880, Sep. 2, 1975, abandoned. This application Oct. 8, 1976, Ser. No. 730,914

Int. Cl.[2] G03C *7/16, 7/00, 5/32, 5/24*

U.S. Cl. 96—22 **53 Claims**

36. A method of forming a multicolor dye image in a photographic element comprised of a support and, coated thereon, at least three layer units each comprised of at least one silver halide emulsion layer containing a developable latent image pattern, each of said layer units being primarily responsible to a different one of the blue, green and red portions of the visible spectrum, the blue-sensitive layer unit containing a yellow-dye-forming color coupler, the green-sensitive layer unit containing a magenta-dye-forming color coupler and the red-sensitive layer unit containing a cyan-dye-forming color coupler, comprising:

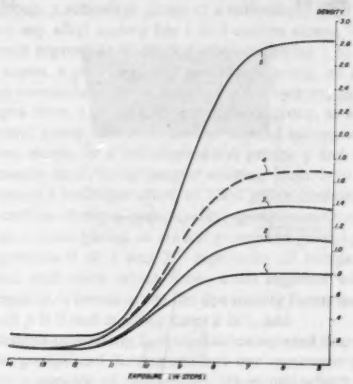
developing a silver image in each of the three layer units corresponding to the latent image pattern thereof;

with a first aqueous alkaline processing solution performing a first redox reaction in each of the layer units by

bringing a cobalt(III) complex, which permanently releases ligands upon reduction, and a reducing agent together and into contact with the element containing the silver image pattern in each layer unit, wherein the cobalt(III) complex and the reducing agent are chosen so that they are essentially inert to oxidation-reduction in the absence of the silver image, and

permitting the selective reaction of the cobalt(III) complex and the reducing agent at the site of the silver image pattern within each layer unit to produce cobalt(II) as an immobile reaction product in a pattern conforming to the silver image pattern in each layer unit; and

thereafter, with a second aqueous alkaline processing solution performing a second redox reaction by



bringing into mutual contact a peroxide oxidizing agent, the immobile cobalt(II) reaction product and a dye-image-generating reducing agent capable of producing a dye-image-generating reaction, wherein the peroxide oxidizing agent and the dye-image-generating reducing agent are chosen so that they are essentially inert to oxidation-reduction in the absence of a catalyst, and

permitting the selective reaction of the peroxide oxidizing agent and the dye-image-generating reducing agent in a pattern conforming to the silver image pattern in each of the layer units to permit a corresponding dye image to be formed therein.

4,097,279

PROCESS FOR PREPARING AN IDENTIFICATION CARD

Edwin Nelson Whitehead, 6208 Tally Ho La., Alexandria, Va. 22307

Continuation-in-part of Ser. No. 431,803, Jan. 8, 1974, abandoned, which is a continuation of Ser. No. 223,649, Feb. 4, 1972, abandoned. This application Jul. 11, 1974, Ser. No. 487,757

Int. Cl.[2] G03C *5/04, 11/12*

U.S. Cl. 96—27 R **41 Claims**

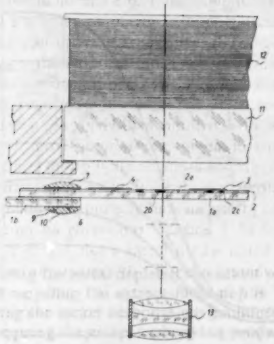
1. A process, utilizing the following raw materials (a) backing means having a heat-sealable surface, (b) a bonding material that is photosensitive and becomes harder upon exposure to light, and (c) a transparent heat-sealable cover, said surface, said bonding material and said cover being compatible in that they may be merged and caused to flow together to form one integral construction when adequate heat and pressure are applied to them, for producing identification cards, comprising: applying said bonding material to said surface of said backing means in a configuration that conforms to the picture to be included as a part of the identification card, the process including applying particulate material to the bonding material, placing the transparent heat-sealable cover over the bonding material and said surface, and applying heat and pressure to cause the materials comprising said surface, said bonding material and said coating to flow together to form an integral identification card with improved alter-proof characteristics.

4,097,280

WEB WITH OVERLAYS FOR USE IN DOCUMENT PRESENTATION DEVICES OF COPYING MACHINES AND METHOD OF MAKING THE SAME

Annemarie Mannhardt, Munich; Rudolf Eppe, Taufkirchen, and Josef Pfeifer, Unterhaching, all of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Germany

Continuation of Ser. No. 482,475, Jun. 24, 1974, abandoned.
This application Aug. 9, 1976, Ser. No. 712,960
Claims priority, application Germany, Jun. 23, 1973, 2332008
Int. Cl.[2] G03C 5/06; B32B 31/00, 3/00
U.S. Cl. 96—44 13 Claims



1. Elongated web for use in a document presentation device in a document reproducing machine having a copying aperture over which an original document to be reproduced is placed, comprising a flexible transparent carrier foil of synthetic plastic material having portions movable into register with the copying aperture and at least one overlay of heat-weldable opaque synthetic plastic sheet material heat-welded to at least one portion of said carrier and serving to conceal information which it is not desired to expose through said copying aperture.

11. A method of affixing overlays which consist of heat-weldable opaque synthetic plastic foil material to a transparent web-like foil-material carrier which also consists, at least in part, of heat-weldable synthetic plastic material and is movable lengthwise in a document presentation device of a document reproducing machine to place selected portions thereof into register with a copying aperture which is overlapped by an original document to be reproduced, comprising the steps of heating the opaque overlays to an elevated temperature at which they are capable of heat-bonding with the foil material of said carrier, and pressing the thus heated opaque overlays against one side of the transparent foil-material carrier so that they become heat-bonded thereto and mask the transparent portions of said carrier to which they are bonded.

4,097,281

HEAT DEVELOPABLE PHOTOGRAPHIC MATERIAL AND PROCESS COMPRISING TRANSITION METAL CARBONYL COMPOUNDS

Sylvia Alice Gardner, Rochester, and Mark Lelental, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 17, 1977, Ser. No. 842,836
Int. Cl.[2] G03C 5/24, 1/00
U.S. Cl. 96—48 HD 33 Claims

1. A heat developable, photographic element comprising a support having thereon, in reactive association,

(a) a photosensitive, transition metal carbonyl compound, wherein said transition metal is selected from transition elements in groups Vb, VIb, VIIb and VIII of the Periodic Table

(b) an oxidation-reduction image-forming combination comprising:

(i) an organotellurium (II) or (IV) compound as an oxidizing agent, with

(ii) a reducing agent, and

(c) a binder.

4,097,282

ANIONIC IMINO-CONTAINING POLYMERIC ADHESIVES FOR PHOTOGRAPHIC MATERIALS

John Michael Noonan; Robert Charles McConkey, and Michael John Hanrahan, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

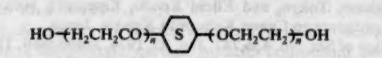
Filed Oct. 15, 1976, Ser. No. 732,628
Int. Cl.[2] G03C 1/76, 1/48, 1/40, 1/78
U.S. Cl. 96—73 25 Claims

15. An image transfer unit comprising:

a photographic element comprising a support having thereon at least one photographic silver halide layer;

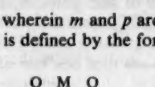
at least one layer comprising an adhesive comprising a water-soluble polyester which comprises:

A. a glycol component comprising one or more diols said glycol component comprising at least 50 mole percent of an aliphatic diol selected from the group consisting of HO—R—H wherein R is $—CH_2CH_2O)_n$ and



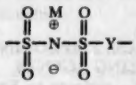
wherein n is an integer from 1 to 4; and

B. an acid component comprising greater than 15 and up to about 35 mole percent of at least one dicarboxylic acid having an iminosulfonyl moiety having the formula

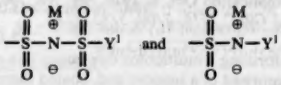


wherein m and p are integers whose sum equals 1;

Q is defined by the formula



Q^1 is selected from the group consisting of



wherein Y is arylene or arylidene; Y^1 is selected from the group consisting of aryl and alkyl; and M is solubilizing cation; and from about 65 to about 85 mole percent of one or more other diacids;

an image-receiving layer;

means containing an alkaline processing composition adapted to discharge its contents within said unit;

a neutralizing layer for neutralizing said alkaline processing composition; and

a barrier layer which is permeable to the alkaline processing composition after a predetermined time, the barrier layer being located between the neutralizing layer and the photosensitive silver halide layer.

23. The image transfer unit of claim 15 comprising:

a. a photographic element comprising a transparent support having thereon the following layers in sequence; an image-receiving layer; an alkaline solution-permeable, light-

reflective layer; an alkaline solution-permeable opaque layer; a red-sensitive silver halide emulsion layer having a ballasted redox cyan dye releaser associated therewith; a green-sensitive silver halide emulsion layer having a ballasted redox magenta dye releaser associated therewith; and a blue-sensitive silver halide emulsion layer having a ballasted redox yellow dye releaser associated therewith;

b. a cover sheet superposed over said blue-sensitive silver halide emulsion layer and comprising a transparent support coated with said neutralizing layer and said barrier layer; and

c. a rupturable container containing said alkaline processing composition and an opacifying agent, said container being so positioned during processing of said unit that a compressive force applied to said container will effect a discharge of the container's contents between said cover sheet and said blue-sensitive silver halide emulsion layer.

4,097,283

WATER-SOLUBLE COMPOSITION ADMIXTURE OF COPOLYMER HAVING ETHYLENIC UNSATURATION IN SIDE CHAIN AND ANTHRAQUINONE PHOTOSENSITIZER

Takateru Asano, Saitama, and Keiko Ito, Ichikawa, both of Japan, assignors to Fuji Chemicals Industrial Company Limited, Tokyo, Japan

Filed Dec. 15, 1975, Ser. No. 640,925
Claims priority, application Japan, Dec. 28, 1974, 50-1418
Int. Cl.[2] G03C *1/68, 1/70*
U.S. Cl. 96—115 R **7 Claims**

1. A water-soluble, photosensitive resin composition comprising a mixture of

(a) a water-soluble unsaturated copolymer having an ethylenic unsaturated bond in the side chain obtained by reacting a prepolymer which is formed by addition polymerization of 40–95 mol% of an unsaturated amide compound, 5–10 mol% of an unsaturated carboxylic acid or salts thereof and each 0–30 mol% of at least one vinyl monomer which is co-polymerizable with the unsaturated amide and unsaturated carboxylic acid or salts thereof selected from the group consisting of vinyl acetate, vinyl propionate, styrene and alkyl-, hydroxyalkyl- or aminoalkylesters of unsaturated carboxylic acid, with an ethylenic unsaturated compound having an oxirane ring under heating in the presence of a polymerization inhibitor, and

(b) a water soluble anthraquinone sulfonic acid, anthraquinone carboxylic acid or salts thereof as photosensitizer, the amount of the ingredient (b) being 0.5 – 20% with respect to the weight of the ingredient a).

4,097,284

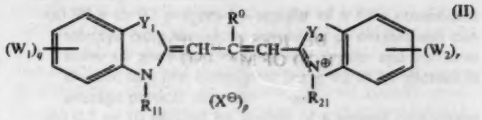
METHOD FOR SUPERSENSITIZING SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Tadaaki Tani, Minami Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Continuation-in-part of Ser. No. 635,546, Nov. 26, 1975, abandoned. This application Oct. 27, 1976, Ser. No. 736,047
Claims priority, application Japan, Nov. 26, 1974, 49-136908; Germany, Nov. 26, 1975, 2553082
Int. Cl.[2] G03C *1/14*
U.S. Cl. 96—126 **14 Claims**

1. A method for spectrally sensitizing a silver halide photographic emulsion, which is characterized by the presence of the combination of

(1) a trimethinecyanine dye of formula (II):



(II)

wherein Y_1 and Y_2 each represents a sulfur atom, a selenium atom, or an oxygen atom; R_{11} and R_{21} each represents an alkyl group, a hydroxyalkyl group, a carboxyalkyl group, a sulfoalkyl group or a sulfoalkoxyalkyl group where any alkyl moiety has 1 to 8 carbon atoms; W_1 and W_2 each represents an alkyl group containing 1 to 4 carbon atoms, a phenyl group, an aralkyl group, an alkoxy group containing 1 to 4 carbon atoms, a hydroxy group, a halogen atom, a cyano group, a carboxy group, an alkoxycarbonyl group, the alkyl moiety thereof having up to 4 carbon atoms, or a trifluoromethyl group; q and r each represents zero or an integer ranging from 1 to 4; R^0 represents a hydrogen atom, an alkyl group containing up to 4 carbon atoms, a hydroxyalkyl group, a carboxyalkyl group, a cyano group, an aralkyl group or a phenyl group; p represents 0 or 1 and $X^{\ominus}$ represents an inorganic or organic acid anion which forms a salt together with the dye moiety, wherein when the dye moiety forms an internal salt p is 0 and in other cases p is 1, and

(2) a nitrogen-containing heterocyclic compound free of any acidic groups and having at least one mercapto group, which is capable of producing a silver salt which is less soluble in water than silver chloride upon reaction with silver ion, the combination being present in said emulsion in a supersensitizing amount, said heterocyclic compound comprising a heterocyclic ring selected from the group consisting of a 1, 2, 4-triazole ring, a 1, 3, 4-thiadiazole ring and a triazolotriazole ring, said nitrogen-containing heterocyclic compound having an acid dissociation constant pKa of 3.5 or more.

4,097,285

DIRECT-POSITIVE PHOTOGRAPHIC SILVER HALIDE EMULSION CONTAINING NOVEL DYE

Akira Tanaka, and Akio Yoshida, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Feb. 17, 1977, Ser. No. 769,570
Int. Cl.[2] G03C *1/16, 1/28*
U.S. Cl. 96—132 **8 Claims**

1. A direct-positive photographic fogged silver halide emulsion characterized by containing at least one cyanine dye in which the position 2 or 4 of a 1,8-naphthyridine ring is joined through the position 2 of a thiazole ring through a methine linkage, said dye being present in an amount sufficient to sensitize said emulsion.

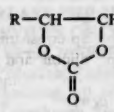
4,097,286

METHOD OF DEPOSITING A METAL ON A SURFACE

Robert Vincent Dafter, Jr., Ewing Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 670,496, Mar. 25, 1976, Pat. No. 4,021,314. This application Jan. 31, 1977, Ser. No. 764,330
Int. Cl.[2] C23C *3/00*
U.S. Cl. 106—1.11 **8 Claims**

5. An electroless metal deposition catalyst comprising a hydrosol obtained by mixing together, in an acidic aqueous medium, a salt of a noble metal and an organic compound, capable of reacting therewith to form said hydrosol, selected from the group consisting of (a) an organic carbonate having a structural formula of



where R is a member selected from the group consisting of an alkyl radical and a hydrogen atom, (b) ethylene glycol and (c) 1,3 dioxane, and heating the resultant mixture having a pH of from 0.3 ranging up to a value of less than 4.0, and wherein said organic compound is present in an amount of at least 50 volume percent.

6. The catalyst as defined in claim 5 wherein R is H.

7. The catalyst as defined in claim 5 wherein R is CH_3.

8. The catalyst as defined in claim 5 wherein said noble metal salt comprises a salt of palladium.

4,097,287

INORGANIC FILM FORMING COMPOSITION FOR COATING

Hitoshi Ito, and Hideo Kogure, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Japan

Filed Sep. 2, 1976, Ser. No. 719,728

Claims priority, application Japan, Sep. 4, 1975, 50-106524; Apr. 8, 1976, 51-39666

Int. Cl.² C09D *5/08*

U.S. Cl. 106—14.14 **15 Claims**

1. An inorganic film forming composition particularly adapted for use as a coating over a zinc rich coating which consists essentially of:

(A) colloidal silica dispersed in water in an amount of about 10-50% by weight as SiO_2;

(B) at least one water soluble organic amine selected from the group consisting of monoethanolamine, diethanolamine, isopropanolamine, ethylenediamine, isopropylamine, diisopropylamine, morphorine, triethanolamine, diaminopropane and aminoethyl ethanolamine in a weight ratio of amine to silica of 1:100 to 2:1;

(C) at least one powdery aluminum compound selected from the group consisting of aluminium oxide, aluminum hydroxide, aluminum silicate, potassium aluminium silicate, calcium aluminum silicate, calcined products of other metallic oxides and inorganic pigments treated by aluminum compounds on the the surface thereof, in a weight ratio of SiO_2 to powdery aluminum compound of 1:50 to 5:1;

(D) powdery glass having an average particle size of 1 to 100 microns;

(E) up to 15 weight percent based on the weight of the water of at least one water soluble amino acid selected from the group consisting of glycine, alanine, aminobutyric acid, valine, norleucine, norvaline and serine;

(F) up to 10% by weight based on the weight of water of thiourea;

(G) up to 55% by weight based on the weight of water of urea; and

(H) up to a molar ratio to silica of 1:50 of at least one water soluble salt of a transition metal or potassium, sodium or ammonium salt of said transition metal wherein said transition metal selected from the group consisting of chromium, molybdenum, tungsten, iron, cobalt, manganese and vanadium.

4,097,288

HEAT SENSITIVE RECORDING COMPOSITION CONTAINING A COMPLEXED PHENOLICS AND A SPIROPYRAN OR LEUCO LACTONE

William R. Lawton, 6651 Jewett-Holmwood Rd., Orchard Park, N.Y. 14127

Filed Feb. 25, 1977, Ser. No. 772,084

Int. Cl.² C09D *11/00*

U.S. Cl. 106—21 **13 Claims**

1. A heat sensitive recording composition comprising

a binder,

a chromogenic compound reactive with a phenol at elevated temperatures to develop a color contrasting visibly with the normal color of said compound, said chromogenic compound being selected from the group consisting of lactone type leuco dyes and spiropyran type leuco dyes, and

a hydrogen-bonded molecular complex of a phenol selected from Table III of the specification and a complexing agent selected from the group consisting of amines and amides, said complex being in stable, unreactive form below 50° C and dissociable into a phenol and an amine or amide by heating above a dissociation temperature in the range of from about 50° to 220° C.

4,097,289

INK WITH ESTER ADDITIVE PROVIDING EASY WIPE OFF OF INK MARKINGS

Hans Joachim Hofmann, and Axel Jankewitz, both of Nuremberg, Germany, assignors to Schwan-Bleistift-Fabrik Schwanhausser & Company, Nuremberg, Germany

Filed Mar. 15, 1976, Ser. No. 666,900

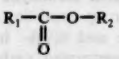
Claims priority, application Germany, Mar. 22, 1975, 2512734

Int. Cl.² C09D *11/08, 11/10, 11/14, 11/16*

U.S. Cl. 106—26 **4 Claims**

1. In an ink containing a readily volatile organic solvent, an ink binder based on a natural or synthetic resin or a cellulose derivative and dyestuff distributed in said binder, the improvement for providing for easy wipe off of writing or markings produced from the ink, comprising:

the presence in said ink of from 2 to 20% by weight of the ink, of an ester compound of the general formula:



wherein one of R_1 and R_2 is a saturated aliphatic hydrocarbon radical having 10 to 22 carbon atoms and the other of which is selected from the group consisting of a cyclopentyl, cyclohexyl and saturated aliphatic hydrocarbon radicals having from 2 to 10 carbon atoms.

4,097,290

BALL-POINT INSTRUMENTS WRITING WITH IMPROVED TRANSITORIALLY ERASABLE TRACE AND INK COMPOSITIONS THEREFOR

Frank Andrew Muller, West Los Angeles, and Henry Peper, Jr., Pacific Palisades, both of Calif., assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 496,046, Aug. 9, 1974, abandoned. This application Mar. 26, 1976, Ser. No. 670,896

Int. Cl.² C08L *93/00;* C09D *11/06, 11/08, 11/10*

U.S. Cl. 106—30 **3 Claims**

1. In a ball-point writing instrument containing an ink capable of depositing an intensely colored trace by writing with its ball on paper, said trace being capable of erasure by the use of a pencil eraser, said ink consisting essentially of between 15% and 45%, by weight, of natural rubber or rubber which essentially duplicates the chemical structure of natural rubber, said rubber being dissolved in a mixture of (a) a volatile low boiling organic solvent having a boiling point less than 180° C and

exhibiting 100% evaporation within 60 minutes, said volatile low boiling solvent rapidly increasing the viscosity of the ink in the trace to minimize the penetration of the paper by the ink, and (b) a high boiling organic liquid solvent having a boiling point of greater than 300° C, said vaporizable organic solvent being present in an amount of between 10% and 50%, by weight, and said high boiling organic liquid solvent being present in an amount of between 15% and 30%, by weight, and from 12% to 30%, by weight, of pigment particles uniformly dispersed in the rubber solution.

4,097,291

CORE AND MOLD MATERIALS FOR DIRECTIONAL SOLIDIFICATION OF ADVANCED SUPERALLOY MATERIALS

Irvin C. Huseby, Schenectady, and Frederic J. Klug, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,763

Int. Cl.² B22C *9/10;* **B22D** *21/00;* **C04B** *35/44;* **B28B** *7/34*

U.S. Cl. 106—38.9 **10 Claims**

1. A ceramic article useful in the casting and directional solidification of advanced superalloy materials consisting essentially of

a two-phase mixture of a material which is one selected from the group consisting of $La_2O_3 \cdot 11Al_2O_3 + LaAlO_3$, $La_2O_3 \cdot 11Al_2O_3 + Al_2O_3$ and $MgAl_2O_4 + Al_2O_3$;

the material is characterized by a microstructure of a plurality of microcracks emanating from approximately a first interface of two different phases and extending at least part way through one phase towards a second interface between two different phases;

the article has a predetermined amount of porosity which is greater than about 10 percent by volume and no greater than about 70 percent by volume, and

at least some of the pores are interconnected.

4,097,292

CORE AND MOLD MATERIALS AND DIRECTIONAL SOLIDIFICATION OF ADVANCED SUPERALLOY MATERIALS

Irvin C. Huseby, Schenectady, and Frederic J. Klug, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,759

Int. Cl.² B22C *9/10;* **B22D** *21/00;* **B28B** *7/34;* **C04B** *35/44*

U.S. Cl. 106—38.9 **6 Claims**

1. A ceramic article useful in the casting and solidification of advanced superalloy materials consisting essentially of

at least one ceramic material selected from the group consisting of $3Y_2O_3 \cdot 5Al_2O_3$, $Y_2O_3 \cdot Al_2O_3$ and $2Y_2O_3 \cdot Al_2O_3$, and

the article has a minimum porosity content of about 10 percent by volume.

4,097,293

METHOD FOR MANUFACTURING HEAT-RESISTANT REINFORCED COMPOSITE MATERIALS

Katsutoshi Komeya, Kawasaki, and Hiroshi Inoue, Kawaguchi, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 270,543, Jul. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 31,345, Apr. 23, 1970, abandoned. This application Jul. 26, 1976, Ser. No. 708,354

Claims priority, application Japan, Apr. 30, 1969, 44-32734; May 2, 1969, 44-33552; United Kingdom, Apr. 28, 1970, 20413/70

Int. Cl.² C04B *35/52, 35/70*

U.S. Cl. 106—43 **8 Claims**

1. A method for manufacturing heat-resistant reinforced composite materials having a fibrous structure which comprises:

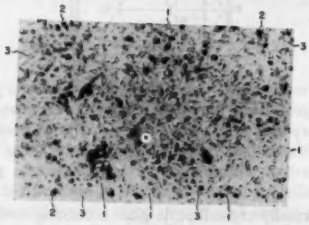
A. providing a mixture of:

(a) 99.8 to 90 percent by weight of a first component selected from the group consisting of nitrides and carbides of aluminum, silicon and boron and mixtures thereof, said first component being 0.2 to 3.0 microns in average particle size, and

(b) 0.2 to 10 percent by weight of a second component selected from the group consisting of oxides of scandium, yttrium and elements of the lanthanum series and mixtures thereof, said second component being 0.1 to 2.0 microns in average particle size,

B. molding said mixture by pressure into a desired form, and

C. sintering the molded mass without application of pressure thereon in at least one gas selected from the group consisting of nitrogen, ammonia and inert gas at a temperature as specified below with respect to the first component contained in said mixture:



aluminum nitride — 1600° to — 2200° C

silicon nitride — 1500° to — 1900° C

boron nitride — 1700° to — 2200° C

aluminum carbide — 1700° to — 2300° C

silicon carbide — 1600° to — 2200° C

boron carbide — 1800° to — 2200° C

7. A heat resistive, reinforced article formed of composite material which consists essentially of fibrous crystals of a first component as defined in claim 1 and an amorphous matrix of garnet containing said second component element formed by the method of claim 1.

4,097,294

PREPARATION OF CERAMICS

Roy W. Rice, Alexandria; Kenneth J. Wynne, Falls Church, and William B. Fox, Alexandria, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 23, 1976, Ser. No. 716,729

Int. Cl.² C04B *35/56, 35/58*

U.S. Cl. 106—43 **6 Claims**

1. A method for preparing a ceramic which comprises:

heating a polymer of the general formula: $[C_2B_{10}H_{10}R_2Si(R_2SiO)_n]_x$ wherein R is selected from the class consisting of alkane, alkene, alkyne, aryl, alkylaryl groups having from 1 to 10 carbon atoms and halogenated derivatives thereof, n is an integer from 1 to 10, and x is greater than 4, to a temperature from 700° to 2000° C with a heating rate not exceeding 100° C/hr. in an inert atmosphere;

maintaining said polymer at said temperature for at least 1 hour; whereby said polymer converts to a ceramic, and

cooling said resulting ceramic to room temperature.

4,097,295

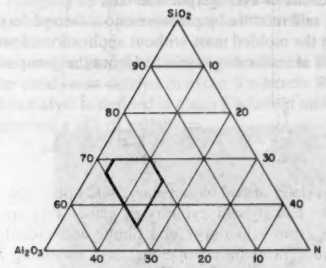
SILICA-ALUMINA-NITROGEN CONTAINING GLASSES FOR PRODUCTION OF GLASS-CERAMICS

Kenneth Chyung, Elmira, and Raja R. Wusirika, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 735,313, Oct. 26, 1976, which is a continuation-in-part of Ser. No. 664,263, Mar. 5, 1976, abandoned. This application Oct. 20, 1977, Ser. No. 843,872

Int. Cl.[2] C03C *3/04, 3/08*

U.S. Cl. 106—52 2 Claims



1. A thermally crystallizable glass consisting essentially, by weight, of about 40–80% SiO_2, 3.5–17% N, said SiO_2 and N constituting at least 50% by weight of the glass composition, and at least 15% M_xO_y, wherein M_xO_y consists of about 10–40% Al_2O_3 and 5–25% of at least one oxide selected from the group consisting of the alkali metal oxides, the oxides of the elements of Group IIA and IIB of the Periodic Table, and B_2O_3.

4,097,296

LOW-TEMPERATURE DEVITRIFIABLE SEALING COMPOSITION

Walter B. Thomas, III, Horseheads, and Christopher H. Welker, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,845

Int. Cl.[2] C03C *3/22, 3/12, 3/10*

U.S. Cl. 106—53 2 Claims

1. A low-temperature devitrifiable sealing composition compatible with color television picture tube glass, said composition consisting of a zircon component and a devitrifiable glass component and including 2–6 parts zircon by weight for each 100 parts of devitrifiable glass by weight, wherein the devitrifiable glass component has a composition consisting essentially, in parts by weight, of about:

77.4 ± 2.0 parts PbO
10.2 ± 1.0 parts ZnO
8.9 ± 1.0 parts B_2O_3
2.6 ± 0.25 parts SiO_2
0.17 ± 0.10 parts MgO
0.22 ± 0.10 parts BaO, and
0.35 ± 0.10 parts F

said sealing composition exhibiting a sealing temperature of about 410°–425° C. and providing a devitrified seal having a thermal expansion mismatch value against 98 expansion color television glass which is within the range of −125 to 0 ppm at room temperature and does not change more than about 40 p.p.m. over the 350°–200° C. temperature range.

4,097,297

BARRIER COATINGS

Frederick J. Keene, Medford Lakes, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 7, 1975, Ser. No. 602,753

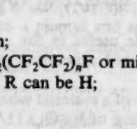
Int. Cl.[2] C08L *1/18;* C09J *3/04*

U.S. Cl. 106—177 3 Claims

1. A coating composition consisting essentially of a non-aqueous solution of:

(A) 25–99.5 parts by weight, based on the weight of (A) plus (B) plus (C), of nitrocellulose film-forming polymer;

(B) 0.5–10 parts by weight, based on the weight of (A) plus (B) plus (C), of a fluorochemical surface tension modifier selected from the group consisting of:



where

M = H or cation;

R = H, $CH_2CH_2(CF_2CF_2)_nF$ or mixtures thereof, and no more than one R can be H;

and

n = 3–8; and

(b) an anionically, cationically or non-ionically N-substituted perfluoroalkyl sulfonamide; and

(C) 0–75 parts by weight, based on the weight of (A) plus (B) plus (C), of a plasticizer.

4,097,298

COATING COMPOSITION HAVING A WATER-DILUTABLE MALEINIZED OIL BASE

Hartmut Haeufler, Aldingen, and Gerhard Günther, Ettlingen, both of Germany, assignors to AKZO N.V., Arnheim, Netherlands

Filed Jan. 19, 1976, Ser. No. 650,351

Claims priority, application Netherlands, Jan. 22, 1975, 7500737

Int. Cl.[2] C08L *91/00*

U.S. Cl. 106—243 11 Claims

1. A water-dilutable maleinized oil based coating composition containing a binder made up of 10–90% by weight of the water-dilutable maleinized oil and 90–10% by weight of a solid particulate polyester which contains halogen-containing polycarboxylic acid in an amount whereby the solid particulate polyester contains a halogen in an amount equivalent to 5 to 35% by weight of chlorine, the percentages by weight of the two components being calculated on the sum of the solvent-free weights thereof, said maleinized oil containing from 10–40% by weight of residues from an α-β-ethylenically unsaturated dicarboxylic acid.

4,097,299

ELEMENTAL SULFUR HAVING IMPROVED IMPACT RESISTANCE

Eugene Ribello Bertozzi, Yardley, Pa., assignor to Thiokol Corporation, Newtown, Pa.

Filed Aug. 13, 1976, Ser. No. 714,162

Int. Cl.[2] C07G *17/00;* C08G *75/10*

U.S. Cl. 106—287.32 9 Claims

1. A composition of matter which is a copolymer comprising the product of the reaction in the molten state of elemental sulfur and from 2 to 50 parts per hundred of a liquid polyformal-polysulfide polymer having terminals non-oxidatively curable by sulfur.

4,097,300
INORGANIC PIGMENTS AND PROCESS FOR PREPARING SAME

Luigi Balducci; Dino Sarti, and Fausto Gerelli, all of Alessandria, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jul. 18, 1977, Ser. No. 816,889
Claims priority, application Italy, Jul. 20, 1976, 25495/76
Int. Cl.[2] C09C *1/36*
U.S. Cl. 106—299 6 Claims

1. A coloured pigment based on titanium compounds characterized in that it consists of the crystalline phases rutile TiO_2, perovskite $CaTiO_3$ and trigonal $CoTiO_3$; it contains 2 to 12% by weight of cobalt and 4 to 20% by weight of calcium, based on the weight of the total TiO_2, and it has a dominant wave length λ_D comprised between 530 and 560 mμ.

4,097,301
STABLE CHLORIDE PROCESS ANATASE SLURRIES

Hans-Achim Dietmar Wildt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 30, 1977, Ser. No. 782,738
Int. Cl.[2] C09C *1/36*
U.S. Cl. 106—300 4 Claims

1. In a process for the production of anatase titanium dioxide pigment by (1) oxidizing titanium tetrachloride in th vapor phase to form anatase titanium dioxide pigment and (2) combining the anatase titanium dioxide pigment from the oxidation reactor with water to form an aqueous slurry,

the improvement for producing highly concentrated slurry having stable viscosity comprising adding to said aqueous slurry, consisting essentially of from 600 g/l to 1400 g/l of anatase titanium dioxide pigment, from 0.03 to 0.45% by weight of an inorganic aluminum compound selected from sodium aluminate and aluminum trichloride, calculated as Al_2O_3 and based on the weight of the titanium dioxide pigment.

4,097,302
FLATTING AGENTS

Howard Joseph Cohen, and Francis Michael Vojik, both of Baltimore, Md., assignors to SCM Corporation, New York, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,276
Int. Cl.[2] C09C *3/10, 7/12*; C09D *5/00, 7/02*
U.S. Cl. 106—312 8 Claims

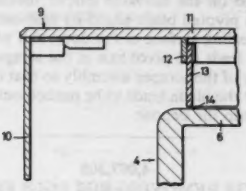
1. In a process for producing a silica flatting agent, wherein a silica hydrogel is treated with from 3.5 to 14.5 parts of a water insoluble inert wax by blending together a silica hydrogel with a wax selected from the group consisting of synthetic wax and microcrystalline wax, the improvement which consists essentially of adding to the silica in a dry process free of water dispersion or emulsification a mixture of waxes consisting of (a) 0.5 to 3.5 percent of a synthetic wax, and (b) 3–11 percent of a microcrystalline wax, wherein the percentages are based on treated hydrogel product, and the ratio of a:b is 1:1.5 to 1:12.

4,097,303
BATCH-TYPE CENTRIFUGE

Helmut Korsch, Cremlingen-Weddel, Germany, assignor to Braunschweigische Maschinenbauanstalt, Braunschweig, Germany

Filed Dec. 29, 1976, Ser. No. 755,331
Claims priority, application Germany, Jan. 23, 1976, 7601807[U]
Int. Cl.[2] B04B *15/00*
U.S. Cl. 127—19 6 Claims

1. A periodically operating batch type centrifuge comprising a centrifugal basket having a cylindrical shell with liquid drain holes and a vertical axis of revolution, said basket further comprising upper and lower end flanges directed radially inwardly toward the axis of rotation of the basket, said upper end flange defining a central filling opening and sugar discharge means surrounded by said lower end flange, housing means in which the centrifugal basket is mounted for rotation, said housing means serving as a collecting space for receiving liquids drained through the liquid drain holes by centrifugal forces when the basket is rotated, said housing means having a wall with an inner surface facing said upper flange, said centrifuge further comprising a cylindrical ring of an elastic, non-rigid material, and means fixedly mounting said cylindrical,

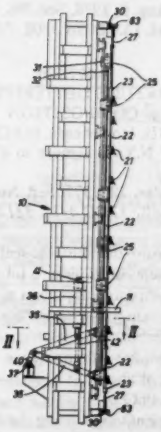


elastic ring coaxially of said basket above said upper end flange with the lower end of said cylindrical, elastic ring spaced a small distance from said upper end flange and radially outwardly of said central filling opening, said mounting means comprising annular means securing said cylindrical, elastic ring in such a position to divert any liquid travelling radially inwardly on said inner surface of said wall and to direct such liquid radially outwardly along said upper end flange.

4,097,304
CLEANING COKE OVEN DOORS

George Taylor, Middlesbrough, England, assignor to British Steel Corporation, London, England

Filed Nov. 3, 1976, Ser. No. 738,628
Claims priority, application United Kingdom, Nov. 10, 1975, 46408/75
Int. Cl.[2] B08B *1/00, 3/02, 7/04*
U.S. Cl. 134—6 13 Claims



1. A method of removing tarry deposits from an elongated narrow sealing surface of a generally rectangular coke oven door, the sealing surface extending continuously about the peripheral side and end areas of the inner surface of the door, comprising

simultaneously scraping the side portions of the sealing surface with bladed elements while directing a moving, high pressure, fan-shaped liquid jet of water or an aqueous cleaning solution at the lower end area of the seal surface, the bladed elements and the jet being reciprocated along

the seal surface, the jet being oriented so its long dimension always extends across the narrow width of the seal surface, and the jet being directed to intersect the seal surface at an acute angle.

5. A cleaning machine for a vertical rectangular coke oven door having a peripheral sealing surface, said surface comprising two side portions joined by upper and lower end portions, the machine including movable carrier means adapted to traverse at least a portion of the door sealing surface, and spaced scapers carried on the movable carrier means, said scrapers each having a pivoted blade urged by resilient biassing means towards the sealing surface of the door, and wherein the edge of each blade leads the pivot axis in the scraper direction and lies outwardly of the scraper assembly so that on encountering a hard deposit the blade tends to be pushed outwardly to press more firmly into the deposit.

4,097,305
METHOD FOR REMOVING BOT EGGS FROM ANIMAL HAIR

Peter J. Chiesa, Jr., Coatesville, and Meredith S. Ott, Hatfield, both of Pa., assignors to Bickmore, Inc., Hudson, Mass.

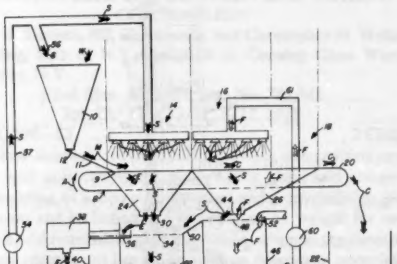
Continuation of Ser. No. 558,328, Mar. 14, 1975, abandoned.
This application Feb. 22, 1977, Ser. No. 770,635
Int. Cl.² A01K *13/00*; B08B *1/00*
U.S. Cl. 134—6 **5 Claims**

1. A method for removing bot eggs from animal hair, which method comprises applying to the hair to soften the cement by which the eggs are adhered to the hair, a thickened aqueous solution containing at least about 2% of an amphoteric surfactant selected from the class consisting of imidazoline surfactants and betaine surfactants and having a hydrophobic C_7 to C_{12} hydrocarbyl group, the solution having a viscosity of at least about 1000 centistokes at ambient temperature, and then scraping the hair having the softened adherents.

4,097,306
METHOD OF CLEANING SWARF

Lyle Carman, Mason, Ohio, assignor to Prab Conveyors, Inc., Kalamazoo, Mich.

Filed Aug. 9, 1976, Ser. No. 712,498
Int. Cl.² B08B *3/08, 7/04*
U.S. Cl. 134—10 **21 Claims**



1. A method for removing cutting fluid residues from particulate swarf which comprises the steps of

contacting said particulate swarf with an aqueous non-ionic detergent solution having a detergent concentration of about 1 to about 5 percent by weight to form an admixture of said swarf and said detergent solution containing detergent in an amount sufficient to emulsify said residues, said detergent solution being alkaline and containing a water-soluble detergent and an oil-soluble detergent;

forming a bed of said particulate swarf bearing the emulsified residues;

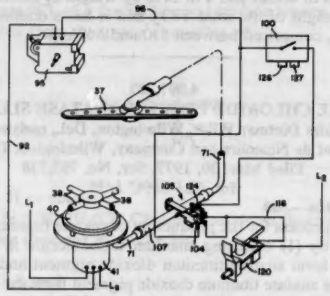
removing the emulsified residues from said particulate swarf by passing through the formed bed a fluid stream at a rate sufficient to entrain therein the emulsified residues and to cleanse the particulate swarf; and

recovering the cleansed particulate swarf.

4,097,307
FILL CONTROL FOR AN AUTOMATIC DISHWASHER

Paul B. Geiger, Piqua, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Dec. 17, 1976, Ser. No. 751,684
Int. Cl.² B08B *3/02*
U.S. Cl. 134—10 **16 Claims**



13. A method of washing dishes in an automatic dishwasher providing an automatic cycle having several time periods in each of which liquid is introduced into, recirculated within, and then drained from the dishwasher for washing and rinsing a load of dishes contained therein, comprising:

(a) introducing liquid into the dishwasher at the beginning of each such time period,

(b) recirculating the liquid by means of a recirculating pump as the liquid is being introduced into the dishwasher,

(c) sensing the amount of output of the recirculating pump, and

(d) continuing to introduce the liquid into the dishwasher while the sensed output is below the predetermined output which is less than the maximum output of which the recirculating pump is capable, to introduce only the minimum quantity of liquid needed to partially close the pump intake to cause the recirculating pump to aspirate the proper ratio of liquid and air into its input to cause the pump to develop the predetermined output, the quantity of liquid being a function of the size, the nature of the soil, and other conditions of the particular load of dishes present at the beginning of each time period, and ordinarily varying from one time period to the next during the course of washing a load of dishes.

15. A method of washing dishes in an automatic dishwasher providing an automatic cycle having several time periods in each of which liquid is introduced into, recirculated within, and then drained from the dishwasher for washing and rinsing a load of dishes contained therein, comprising:

(a) sensing the pressure of the liquid at a predetermined location as it is being recirculated within the dishwasher,

(b) introducing the liquid into the dishwasher at the start of at least one designated period as long as the sensed pressure is below a first pressure to introduce sufficient liquid into the dishwasher to cause the same to develop the first pressure with as little liquid as needed therefor,

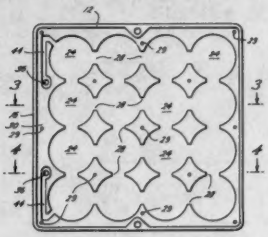
(c) recirculating the liquid within the dishwasher at the first pressure during this designated dishwasher period, and

(d) recirculating the liquid within the dishwasher at a second pressure different from the first pressure during a subsequent designated dishwasher period to provide different recirculation pressures during certain periods of the automatic cycle of the automatic dishwasher.

4,097,308
GLASS ENCLOSED SOLAR CELL PANEL

William Richard Klein; Carl Leroy Kotila, and Ira Leslie Krams, all of Houston, Tex., assignors to Tideland Signal Corporation, Houston, Tex.

Filed Aug. 17, 1977, Ser. No. 825,312
Claims priority, application United Kingdom, Apr. 28, 1977, 17893/77
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 H 12 Claims

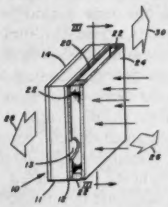


4. A solar cell panel comprising,
a top molded glass plate having a downwardly directed sidewall extending around the outer periphery,
a bottom molded glass plate positioned beneath and within the downwardly directed sidewall of the top plate with the outer periphery of the bottom plate being closely adjacent the inside of the sidewall of the top plate for providing a downwardly directed opening to the compartment formed between the top and bottom plates,
a plurality of recesses molded in the bottom of the top plate or the top of the bottom plate for receiving solar cells whereby the thickness of the compartment is minimized,
a solar cell positioned in each of the plurality of recesses,
potting compound having an index of refraction similar to the index of refraction of glass filling the compartment, and
electrical connections to said solar cells sealably extending through the bottom plate.

4,097,309
THERMALLY ISOLATED SOLAR CELL CONSTRUCTION

William E. Horne, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 31, 1977, Ser. No. 764,383
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—89 PC 12 Claims



1. A solar radiation converter comprising:
means for converting electromagnetic wave energy into electrical energy, said means including a substrate of semiconductive material of one type conductivity forming a P-N junction with a layer of semiconductive material of the opposite type conductivity, said means having a receiver surface adapted for exposure to electromagnetic wave energy for conversion to electrical power, said means including electrical interconnect means adhered to a surface thereof distinct from said receiver surface,
a first cover plate covering at least one of said surfaces of said means,
a second cover plate covering said first cover plate in an outwardly, spaced-apart relation,
one of said first and second cover plates being adapted to absorb and radiate incident electromagnetic wave energy with a wavelength above 5 microns, and
standoff members interposed between said first and second cover plates in a manner to form a gap therebetween to define a thermal isolation barrier.

4,097,310
METHOD OF FORMING SILICON SOLAR ENERGY CELLS

Joseph Lindmayer, 6919 Blaisdell Rd., Bethesda, Md. 20034

Continuation of Ser. No. 583,274, Jun. 3, 1975, abandoned. This application Jun. 16, 1977, Ser. No. 807,299
Int. Cl.[2] H01L *31/00*
U.S. Cl. 136—89 SG 6 Claims

1. A method of improving the electron generating efficiency of a silicon solar energy cell while forming same from an individual wafer of silicon having at least one dimension larger than the corresponding dimension of the cell, comprising treating the wafer to produce at a surface thereof a junction at which electrons are generated when the surface is exposed to light, and thereafter using a dicing saw having a diamond blade rotating at least at 5,000 r.p.m. and cutting the individual treated wafer at and through said surface junction to form a cell having at least one dimension less than that of said wafer and improved electron generating efficiency when said surface is exposed to light.

6. A silicon solar energy cell formed by the practice of the method of claim 1.

4,097,311
ABSORPTION SURFACE OF SOLAR COLLECTOR

Toshihiro Ishibashi; Kinya Horibe; Masaharu Ishida, and Youzi Sano, all of Kosai, Japan, assignors to Yazaki Sogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1976, Ser. No. 715,309
Claims priority, application Japan, Sep. 22, 1975, 50-113747
Int. Cl.[2] C23F *7/04*
U.S. Cl. 148—6.21 14 Claims

12. A process for manufacturing the selective absorption surface of the solar collector, in which the stainless steel having a mirror-like surface having a roughness of Ra of less than 0.07 μ or Rz of less than 0.2 μ determined according to the method of ISO Recommendation R 468, and the metal composition comprising; 0.001 – 0.15 wt % of C, 0.005 – 3.00 wt % of Si, 0.005 – 10.00 wt % of Mn, 11.00 – 30.00 wt % of Cr, 0.005 – 22.00 wt % of Ni, optionally 0.75 – 5.00 wt % of Mo, and the balance being Fe; is chemically oxidized in an acidic bath consisting of 150 – 800 g/l of sulfuric acid and a compound selected from the class consisting of 100 – 400 g/l of sodium, 100 – 400 g/l of potassium bichromate or 40 – 700 g/l of chromium trioxide, at the temperature of 50° C to the boiling point, a dipping time of 3 – 40 minutes to form the oxide film at a thickness of 500 to 2,000 A.

4,097,312

PRETREATMENT FOR THE RESISTANCE WELDING OF ALUMINUM

Geoffrey A. Dorsey, Jr., Danville, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 709,026, Jul. 7, 1976, which is a continuation-in-part of Ser. No. 610,966, Sep. 8, 1975, Pat. No. 4,004,951, which is a continuation-in-part of Ser. No. 593,092, Jul. 3, 1975, abandoned. This application Aug. 13, 1976, Ser. No. 714,155

Int. Cl.[2] C23F *7/06*

U.S. Cl. 148—6.27 16 Claims

1. A method of preparing an aluminum workpiece for the resistance welding thereof comprising

(a) developing a freshly oxidized surface on the aluminum workpiece having a surface resistance of at least 25 but less than about 500 microhms; and

(b) stabilizing the freshly oxidized aluminum surface by treating with a hot aqueous alkaline solution having a pH of about 8-10 and containing at least one part per million of a long chain aliphatic carboxylic acid having from 12–22 carbon atoms or an equivalent carboxylate compound.

4,097,313

METHOD OF RECOVERY OF FERROMAGNETIC METAL OR ALLOY PARTICLES BY USING A MAGNETIC DRUM

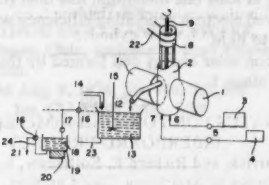
Yasumichi Tokuoka; Kazumasa Fukuda, and Akihiko Hosaka, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 744,116

Claims priority, application Japan, Dec. 8, 1975, 50-1416160

Int. Cl.[2] H01F *1/02*

U.S. Cl. 148—105 5 Claims



1. In a process for preparing ferromagnetic metal or alloy particles which comprises reducing ferromagnetic metal ions in a solution with a reducing agent to obtain a slurry of ferromagnetic metal or alloy particles and separating the said particles from said slurry, the improvement which comprises:

separating said particles from said slurry by attracting said particles on a magnetic drum;

washing said particles;

recovering said particles from said magnetic drum.

4,097,314

METHOD OF MAKING A SAPPHIRE GATE TRANSISTOR

Kenneth Mansfield Schlesier, Stockton; Carl William Benyon, Jr., Trenton, and Joseph Michael Shaw, East Windsor Township, Mercer County, all of N.J., assignors to RCA Corp., New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,965

Int. Cl.[2] H01L *21/225*

U.S. Cl. 148—188 10 Claims

1. A method of making an improved complementary field effect transistor pair comprising the steps of:

(a) forming a pair of laterally spaced semiconductor islands of N type and P type conductivity adjacent an insulating substrate;

(b) coating the islands with an aluminum oxide layer at a first known temperature;

(c) coating the aluminum oxide layer with a polycrystalline silicon layer;

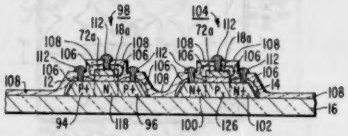
(d) coating the polycrystalline silicon layer with a doped oxide;

(e) heating the coated polycrystalline silicon layer at a second temperature less than said first temperature for a preselected period to drive the dopant from the doped oxide into the polycrystalline silicon layer;

(f) removing the doped oxide;

(g) depositing an undoped oxide adjacent the polycrystalline silicon layer;

(h) defining said undoped oxide into a mask for gates;



(i) removing portions of the polycrystalline silicon layer and the aluminum oxide layer uncovered by the masks;

(j) forming a layer of N-doped oxide adjacent the P type island;

(k) forming another layer of P-doped oxide adjacent the N type island;

(l) heat treating both islands simultaneously at a third temperature no greater than said second temperature for a predetermined period;

(m) removing all oxides;

(n) oxidizing the wafer at a fourth temperature less than said third temperature for an oxidation period; and

(o) annealing the islands in hydrogen at a fifth temperature less than said first temperature.

4,097,315

MAGNETIC ORIENTATION OF CASTING POWDER GRANULES

William H. Gardner, Lavale, Md.; Donald H. Graham, Fort Ashby, W. Va., and George M. Williams, Cumberland, Md., assignors to Hercules Incorporated, Wilmington, Del.

Filed Mar. 21, 1968, Ser. No. 715,131

Int. Cl.[2] C06B *45/00*

U.S. Cl. 149—2 11 Claims

1. A granule of propellant casting powder having incorporated therein a magnetic material having a magnetic susceptibility of at least about $0.1/4\pi$, said magnetic material being incorporated in said granule of propellant casting powder in an amount sufficient to orient the propellant casting powder granule in the desired direction when said granule of propellant casting powder is subjected to an applied magnetic field.

4,097,316

METHOD FOR GELLING NITROPARAFFINS IN EXPLOSIVE COMPOSITIONS

John J. Mullay, Hazelton, Pa., assignor to Atlas Powder Company, Tamaqua, Pa.

Filed Mar. 15, 1977, Ser. No. 777,694

Int. Cl.[2] C06B *45/00*

U.S. Cl. 149—2 49 Claims

1. A process for preparing an explosive gel composition which comprises an inorganic nitrate and a nitroparaffin comprising:

(a) forming an aqueous solution comprising an inorganic nitrate;

(b) adding a nitroparaffin to said aqueous solution;

(c) adding a polymeric thickening agent for nitroparaffins selected from the group consisting of cellulose acetate,

cellulose acetate butyrate, cellulose acetate propionate, polymers of methyl, ethyl and butyl methacrylate, copolymers of vinylidene chloride and acrylonitrile, and mixtures thereof to said aqueous solution while agitating to form a nigroparaffin gel dispersed within said aqueous solution;

(d) gelling said aqueous solution by adding an effective amount of an aqueous gelling agent.

4,097,317
DESENSITIZING AGENT FOR COMPOSITIONS CONTAINING CRYSTALLINE HIGH-ENERGY NITRATES OR NITRITES

Joel M. Schnur, Springfield, Va.; Richard S. Miller, Crofton, Md.; James P. Sheridan, Burke, and A. D. Britt, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

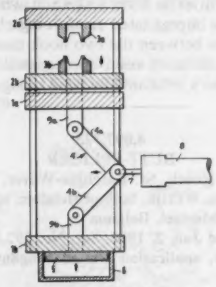
Filed Mar. 25, 1977, Ser. No. 781,278
Int. Cl.² C06B *45/34, 25/34, 45/06*
U.S. Cl. 149—7 **6 Claims**

1. In a method for desensitizing a composite energetic composition with high-energy nitrate or nitrite crystals the improvement which comprises coating said crystals, prior to compounding said composition, with saligenin in a crystal-to-saligenin weight ratio from 1820:1 to 600:1.

4,097,318
METHOD FOR SEALING PLASTIC-METAL LAMINATES

Hans Joachim Olschewski, Berlin, Germany, assignor to FKF Berlin Fleischwaren-und Konserven- Fabrik Schulz & Berndt GmbH and Co., KG, Germany

Filed May 10, 1976, Ser. No. 684,942
Claims priority, application Germany, May 9, 1975, 2521234; Aug. 26, 1975, 2538316
Int. Cl.² B29C *27/00*
U.S. Cl. 156—69 **5 Claims**



1. A process for sealing the plastic layers of two plastic-metal laminates comprising the steps of:

heating and pressing together the laminates to place the plastic layers of said laminates in contact;

rapidly increasing the pressure to a predetermined value with which the laminates are pressed together;

maintaining the predetermined pressure for a predetermined period; and

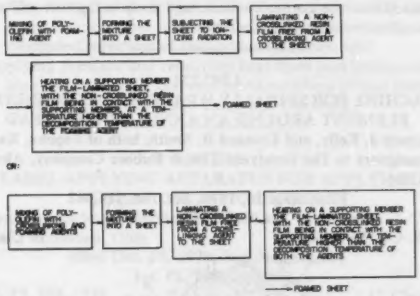
releasing the pressure from said laminates,

wherein the period for rapidly increasing the pressure to the predetermined value is less than 20% of the total interval between the start of pressure increase and the start of pressure release.

4,097,319
METHOD OF MANUFACTURING A COMPOSITE FOAMED POLYOLEFIN SHEET

Hayao Shimokawa, Ebina; Makoto Nakamuri; Hideyo Ueno, both of Hiratsuka; Isamu Namiki, Yokohama, and Naonori Shiina, Tokyo, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1976, Ser. No. 660,855
Claims priority, application Japan, Feb. 26, 1975, 50-23681
Int. Cl.² B29D *27/00*
U.S. Cl. 156—79 **13 Claims**

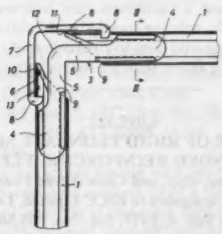


1. A method of manufacturing a composite foamed polyolefin sheet which comprises the steps of laminating a film of noncross-linked thermoplastic resin free from a crosslinking agent to at least one surface of a crosslinked polyolefin base sheet containing a thermally decomposable foaming agent or a polyolefin base sheet containing a foaming agent and a cross-linking agent, and carrying out thermal foaming of said film-laminated sheet by heating said sheet on a supporting member under atmospheric pressure with the non-crosslinked resin film laminated to the sheet being in contact with the supporting member.

4,097,320
METHOD OF MANUFACTURING A DOUBLE GLASS PANEL UNIT

Harald Otto Christian Brauer; Knud Sejr Jensen; Torben Andreasen, all of Korsor; Hilmer Jensen, Skaelskor; Mogens Greve, and Peter Kürstein, both of Korsor, all of Denmark, assignors to Scanglas A/S, Korsor, Denmark

Filed Apr. 5, 1977, Ser. No. 784,908
Claims priority, application Denmark, Apr. 12, 1976, 1694/76
Int. Cl.² C03C *27/00*; E06B *3/24*
U.S. Cl. 156—109 **3 Claims**



1. A method of manufacturing a double glass panel unit having at least two glass panels between which a spacer frame is arranged consisting of straight, rigid rail means having a hollow profile, the rail means being mitre cut at their ends and joined edge against edge and held in position by angular coupling members, the arms of which are inserted in the cavities of the rails, and a seal being provided by injecting sealing material

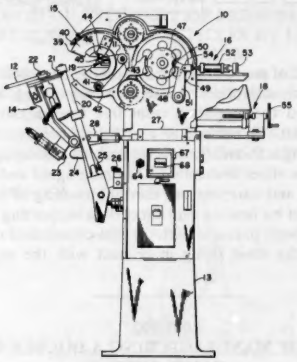
in corner cavities, each of which is limited by an outwardly facing surface of the coupling member and the inner walls of the rail means, wherein a layer of adhesive is applied to surfaces of the rail means facing the glass panels before the latter are mounted on the frame, said rail means being arranged and held in a position in which in each corner of the spacer frame a distance is provided between the inclined end surfaces of the rail means by the use of a coupling member having a strap adapted to engage holes in the rail means when the rail means are in spaced relationship, and the adhesive is applied to the rail means in this position, whereafter the rail means are pushed together so that the inclined surfaces will abut each other before the sealing material after mounting of the glass panels is pressed into the corner cavities, said strap being torn off after the adhesive supplying operation.

4,097,321

MACHINE FOR SPIRALLY WRAPPING A CONTINUOUS ELEMENT AROUND AN ANNULAR TIRE BEAD

Emmett J. Kelly, and Leonard R. Smith, both of Topeka, Kans., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 16, 1976, Ser. No. 714,862
Int. Cl.² B29H *17/32*
U.S. Cl. 156—136 **10 Claims**



10. Method of positioning a rotatable winding shuttle, in a closed tire bead ring wrapping machine, relative to bead holding and rotating means comprising driving the shuttle in rotation about its own axis at a predetermined angular speed, counting the revolutions of said shuttle while in said rotation, actuating braking means in response to a first predetermined number of the so-counted revolutions thereby decellerating said shuttle, and then actuating latching mechanism having a cooperable cam and a cushioned cam follower to stop and position said shuttle, relative to said bead holding and rotating means, and allowing said cam to override said cam follower if said cam is rotating faster than a predetermined speed.

4,097,322

MANUFACTURE OF RIGID ELONGATE MEMBERS OF RESIN BONDED REINFORCING ELEMENTS

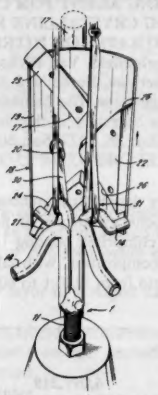
David James Greene, Opy, and Colin Alfred Pearson, Wembley, both of England, assignors to BICC Limited, London, England

Filed Feb. 4, 1977, Ser. No. 765,587
Claims priority, application United Kingdom, Feb. 4, 1976, 4390/76
Int. Cl.² B65H *81/00*
U.S. Cl. 156—149 **14 Claims**

1. A method of manufacturing a substantially rigid elongate member of resin bonded reinforcing elements which comprises:

(a) feeding at least one resin impregnated reinforcing element through an apertured guide, which guide is transversely spaced from the common axis of two hook means each mounted stationary in space with one substantially vertically above and spaced from the other and each rotatable about their common axis, and securing one end of the reinforcing element to one of said two hook means;

(b) causing the apertured guide to travel in a direction substantially parallel to the common axis of said hook means to and beyond one hook means, the guide engaging and effecting partial rotation of the hook means about said common axis with respect to the guide as the guide approaches the hook means, reversing the direction of travel of the guide to wind the reinforcing element over the hook means, and repeating the aforesaid steps at each



hook means alternately to form a plurality of elongate loops of reinforcing elements;

(c) cutting the reinforcing element and securing the free end of the element to one of said plurality of loops and one of said hook means;

(d) rotatably driving at least one of said hook means with respect to the other hook means about their common substantially vertical axis to twist the elongate loops to such an extent as to form a skein in which the helically twisted resin impregnated reinforcing elements are held under tension between the two hook means; and

(e) curing the skein of resin impregnated reinforcing elements to form a substantially rigid elongate member.

4,097,323

BUTT-SPLICER

Joseph Irma De Roeck, St. Katelijne-Waver, and Lucien Antoine Christiaen, Wilrijk, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Jun. 2, 1976, Ser. No. 692,146
Claims priority, application United Kingdom, Jun. 4, 1975, 24140/75
Int. Cl.² B65H *19/08*
U.S. Cl. 156—159 **7 Claims**

1. A butt-splicer apparatus for butt-joining a fresh web to a running web without interruption of the motion of the running web, said apparatus comprising:

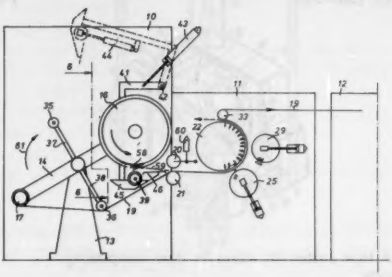
a rotatable cylindrical web-supporting roller having perforations around its periphery and means for creating a vacuum in at least a segmental portion of its periphery,

guide means for guiding said running web at least during a splicing operation along a path which extends into tangential contact with a point on the peripheral path of said roller and then wraps downstream from said tangential point around a predetermined arcuate portion equal to at least about 90° of the roller periphery, whereby the running web is biased against the roller periphery by the

running tension therein, said arcuate portion including said segmental portion in which said vacuum is created,

means for delivering the leading end of the fresh web into the convergence between the said web-supporting roller and the immediately upstream region of the running web while said running web is passing through said path wrapped around said roller, whereby the fresh web end is engaged and held between the tensioned running web and the contiguous arcuate roller peripheral portion to advance the same,

a rotatable cutter disposed adjacent the web-supporting



roller periphery at a locus within said predetermined arcuate portion, said cutter being operable to be brought into pressing contact with the running web surface to cut both webs generally transversely along a common line while both are supported on the roller surface, and

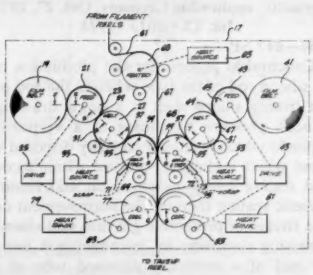
a rotatable tape applicator which is disposed adjacent the web-supporting roller peripheray at a locus downstream of said cutter but within said predetermined arcuate portion of said periphery, said applicator being operable to be brought into pressing contact with the exposed surfaces of the margins of both webs adjacent said common cutting line to apply a tape splice thereto.

4,097,324

METHOD AND APPARATUS FOR MAKING AN ELONGATED LATTICE STRUCTURE

Leroy L. Emmel, 1800 Wallace Ave., Apt. R, Costa Mesa, Calif. 92627

Filed Apr. 4, 1977, Ser. No. 784,603
Int. Cl.² B29D *3/00*; B29C *27/02*
U.S. Cl. 156—179 **11 Claims**



1. A method for making a lattice supported filament structure comprising the steps of:

applying heat to a first film belt to melt said first film belt;

molding the heated first film belt into a lattice structure having a plurality of joined elongated members connected with periodically spaced cross-strips therebetween, each of said joined elongated members having a depression molded therealong adapted to receive and engage an elongated filament;

applying heat to a plurality of elongated filaments to heat said elongated filaments to a temperature above the melting point of said joined elongated members of said lattice structure;

bringing each of said plurality of elongated filaments into engagement with one of said depressions molded along one of said elongated members of said lattice structure;

applying pressure to the lattice combination of the heated elongated filaments engaged with said joined elongated members of said lattice structure to enable the transfer of heat from said elongated filaments to said elongated members to melt said elongated members adjacent said elongated filaments and adhere said elongated filaments to said elongated members of said lattice structure; and

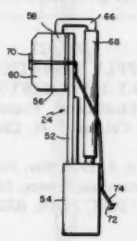
applying pressure and removing heat from said lattice combination to solidify said elongated members of said lattice structure adhered to said elongated filaments.

4,097,325

LABEL-APPLYING APPARATUS FOR APPLYING THERMOPLASTIC LABELS

Edward A. Schnier, Hubbardston, Mass., assignor to A-T-O Inc., Cleveland, Ohio

Filed Oct. 15, 1973, Ser. No. 406,334
Int. Cl.² B65C *3/08*
U.S. Cl. 156—215 **13 Claims**



1. The method of applying thermoplastic labels to containers comprising vacuum picking dry thermoplastic labels one at a time from a stack of dry labels, transferring the dry labels to a place of application to a container, while making the transfer heating a portion of the label to render said portion tacky, pressing the tacky portion of the label against the container at the place of application and then while moving the container along a predetermined path away from said place of application heating the entire area of the label to make it adhesive and pressing it against the container.

4,097,326

POWER ACTUATED LAMINATING MACHINE

Joe D. Giulie, and Leslie E. Worcester, both of Palo Alto, Calif., assignors to Permax, Palo Alto, Calif.

Filed Apr. 5, 1977, Ser. No. 784,680
Int. Cl.² B30B *15/34*
U.S. Cl. 156—366 **6 Claims**

1. A laminating machine for use with pre-fabricated laminating packets wherein said packets have a pair of heat sealable sheets connected together at one edge with a tear-off tab at the point of connection, said tear-off tab having a generally straight end with a plurality of notches in said end, comprising in combination:

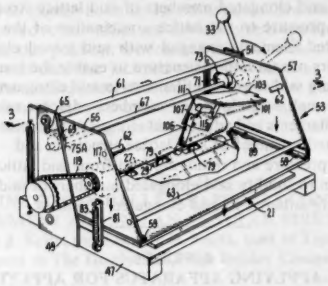
a. upper and lower flat heating elements;

b. upper and lower rollers adjacent the exit end of said heating elements and spaced therefrom;

c. stop fingers located between said heating element and said rollers, said fingers being adapted to engage the tab between the notches whereby portions of said tear off tab on

said packet extend beyond said fingers and between said rollers;

d. means for bringing said heating elements and said rollers together to engage the heat sealable portion of a laminating packet between the heating elements and the tab between said rollers and simultaneously move said fingers out of contact with said packet;



e. means for maintaining said packet between said heating elements for time sufficient to soften the laminating sheets; and

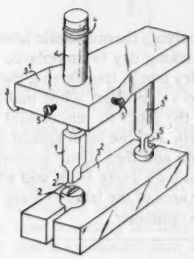
f. motor means for rotating said rollers to pull said packet between said rollers to complete the laminating operation.

4,097,327

APPARATUS TO APPLY VIBRATIONS TO PARTIALLY OR COMPLETELY THERMOFUSIBLE ARTICLES

Philipe Calemard, L'Etrat-Loire, France, assignor to Station Service-Textile F. Calemard et Cie S.A., Saint-Etienne, France

Filed Mar. 5, 1976, Ser. No. 664,415
Claims priority, application France, Mar. 13, 1975, 75 08478
Int. Cl.[2] B29C *27/08;* **B32B** *31/00*
U.S. Cl. 156—515 **17 Claims**



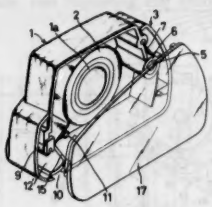
1. Ultrasonic apparatus for operation on material which is at least partially thermofusible, said apparatus comprising ultrasonic generator means including a low frequency generator, an electroacoustic transducer coupled to said generator, a sonotrode coupled to said transducer and constituting a working tool, a counter tool having an upper surface facing said sonotrode, such that the material to be operated on can be transported between the sonotrode and the counter tool, and support means for said transducer, sonotrode and counter tool, said support means comprising an aperiodic support member, said counter tool comprising a base and a projection on said base having an edge of substantially reduced width in relation to said base to constitute a counter bearing impact surface for said working tool permitting simultaneous cutting of the material and fusion of the resulting selvedges at the cut edges, said support member having a recess with a shape corresponding to the base of said counter tool, said base being slidably and demountably mounted in said recess in alignment with said sonotrode, said support member including a lower portion having said recess and an upper portion carrying said sonotrode and to which said transducer is secured.

4,097,328

TAPE CUTTER

Sakae Urushizaki, c/o Nishidotonbori Corpo, No. 4-1, 5-chome, Nishidotonbori-dori, Nishi-ku, Osaka-shi, Osaka-fu, Japan

Filed Sep. 6, 1977, Ser. No. 830,793
Claims priority, application Japan, Mar. 9, 1977, 52-29083
Int. Cl.[2] B32B *31/00;* **B44C** *7/00*
U.S. Cl. 156—523 **1 Claim**



1. A tape cutter for adhesive tape comprising:

a body,

a swing member pivoted on said body to be pivotable about one end thereof, urged upwardly by a spring, to hold an adhesive tape roll rotatably,

a tape press roller rotatably pivoted on the bottom of said swing member at the other end thereof, said tape press roller and the leading edge of said adhesive tape adapted to protrude through an opening in the bottom of said body when said swing member is pivoted down,

a disc rotatably pivoted on said body to be disposed between the side plates of said body and of said swing member and to be rotatable as said swing member is pivoted up and down, and

a blade mounted on said disc to cut the adhesive tape when the swing member is released to pivot up.

4,097,329

PROCESS FOR THE PRODUCTION OF MONOCRYSTALLINE SILICON RODS

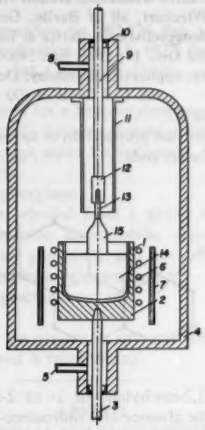
Horst Stock, Burghausen, and Adalbert Ellbrunner, Seibersdorf, both of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik Grundstoffe mbH, Burghausen, Germany

Filed Sep. 13, 1976, Ser. No. 722,236
Claims priority, application Germany, Oct. 27, 1975, 2548046
Int. Cl.[2] B01J *17/18*
U.S. Cl. 156—617 SP **2 Claims**

1. In a Czochralski process for the production of a monocrystalline silicon rod of the type wherein the rod is vertically withdrawn from a silicon melt in a single drawing chamber under reduced pressure by means of a vertically-movable drawing spindle which is at least partially disposed within said chamber and which is slidably received within a concentrically-arranged sealing gasket mounted on said chamber to enhance hermetic sealing thereof, the improvement comprising:

passing a stream of protective gas into said chamber during the drawing operation by introducing it into the open, upper end of a vertically disposed tube of substantial length which is mounted within said chamber above said melt and which concentrically surrounds the drawing spindle and the growing silicon rod and has a radial width of about 5 to 60mm to provide sufficient annular clearance and which has a lower, open end which is between 150 and 350 mm above the surface of the melt such that the protective gas flows along the spindle and silicon rod in the direction of the melt surface, so as to prevent diffusion of reaction gases from the melt to the spindle surface and

subsequent deposition thereon which, in turn, would be stripped therefrom by said sealing gasket and fall into the melt therebelow, said protective gas being passed through



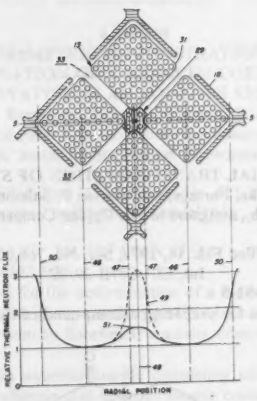
said chamber in an amount between 300 and 800 Nl/hour and said drawing operation taking place at a reduced pressure of between 1 and 100 Torr.

4,097,330

INSTRUMENTATION ASSEMBLY FOR NUCLEAR REACTOR

John P. Neissel, San Jose; Harry H. Hendon, Saratoga, and James H. Terhune, San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Jan. 10, 1977, Ser. No. 758,171
Int. Cl.[2] G21C *17/10*
U.S. Cl. 176—19 R **20 Claims**



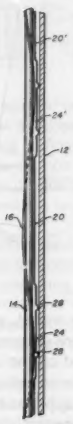
1. A neutron detector assembly for use in a fluid moderated thermal neutron reactor core wherein said core includes a plurality of replaceable fuel assemblies of substantially square cross section shape and wherein said fuel assemblies are positioned in spaced relation to provide gaps for fluid moderator therebetween, comprising: an elongated solid moderator-displacing member adapted for positioning in said core between the corners of an adjacent four of said spaced fuel assemblies, said member extending through said core for a length at least equal to the active height of said core, said member having transverse cross section dimensions equal to the diagonal distance between the corners of said four fuel assemblies less a tolerance required for insertion, removal and thermal expansion of said fuel assemblies whereby the moderator in the space between said corners of said adjacent four fuel assemblies is substantially completely displaced to thereby depress and flatten the neutron flux therebetween, said moderator-displacing member being formed with at least one longitudinal passage for receiving a neutron detector for monitoring the neutron flux in said space over the power range of operation of said core, said moderator-displacing member being formed of a metal selected such that said transverse cross section dimensions thereof are less than one-fourth of the reciprocal of the slowing-down power of said metal for fast neutrons and less than one-half of the reciprocal of the macroscopic absorption cross of said metal for thermal neutrons.

4,097,331

COOLANT MASS FLOW EQUALIZER FOR NUCLEAR FUEL

Paul R. Betten, Windsor, Conn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 2, 1976, Ser. No. 646,010
Int. Cl.[2] G21C *3/08*
U.S. Cl. 176—81 **9 Claims**



1. In a fuel assembly for a nuclear reactor, the fuel assembly including a coolant duct and a bundle of elongated parallel fuel rods positioned within the duct, the fuel rods each being provided with a spirally wound external spacer member, the fuel assembly having a plurality of sides defined by straight wall portions of the coolant duct, the improvement comprising:

a corrugated sleeve positioned within said coolant duct between the fuel rods and the inner wall of the duct, said sleeve having a shape commensurate with the interior shape of the duct and comprising:

a liner defining member, the liner defined by said member having a plurality of sides oriented generally parallel to the coolant duct inner walls immediately adjacent thereto;

a plurality of vertically spaced inwardly displaced portions of said liner defining member, said inwardly displaced liner portions having a parallelogram shape, the frequency of occurrence and length of said inwardly displaced liner portions being determined by the pitch of the spirally wound spacer members, said inwardly displaced liner portions occurring in regions where the spacer member on the peripheral fuel rods of the fuel rod bundle are on the sides of the fuel rods disposed away from the coolant duct wall whereby said inwardly displaced liner portions are vertically displaced on

adjacent sides of the liner and closely approach the peripheral fuel rods; and

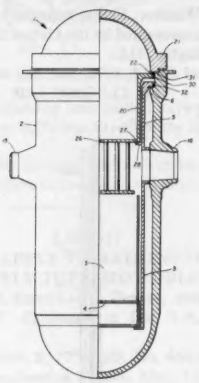
spring means on said liner defining member, said spring means permitting expansion of the liner toward the coolant duct.

4,097,332

HOLDDOWN STRUCTURE FOR A NUCLEAR REACTOR CORE

John Francis Gibbons, and Daniel John McLaughlin, both of Windsor, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 13, 1976, Ser. No. 749,860
Int. Cl.[2] G21C *13/02*
U.S. Cl. 176—87 6 Claims



1. In a nuclear reactor vessel, a structure for applying a holddown force to the core support barrel, including,

an internal ledge formed on the upper end of the vessel,

a core support barrel positioned down and within the vessel,

a flange formed on the upper end of the core support barrel and arranged to engage the internal ledge of the vessel to hang the barrel from the iedge,

a closure for the reactor vessel and means for seating the closure on the upper end of the vessel with a predetermined force,

and a holddown barrel arranged in the vessel to extend from the closure to a seat on the core support barrel, the seat being located a substantial distance below the internal ledge.

4,097,333

ENZYMATIC METHOD OF PRODUCING GLUCOSE FROM ETHYLENE TREATED CELLULOSE

Arthur H. Freytag, Longmont, and James C. Linden, Loveland, both of Colo., assignors to The Great Western Sugar Company, Denver, Colo.

Filed Jun. 22, 1977, Ser. No. 808,812
Int. Cl.[2] C12D *13/02;* C12B *3/06*
U.S. Cl. 195—33 9 Claims

1. A method of producing glucose through the enzymatic hydrolysis of cellulosic material, comprising contacting the cellulosic material with a sufficient amount of ethylene to enhance the production of glucose and hydrolyzing at least a portion of the cellulosic material to glucose in the presence of cellulose.

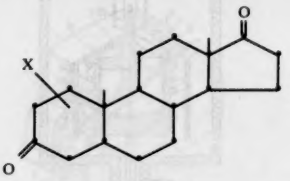
4,097,334

PROCESS FOR THE PREPARATION OF ANDROSTANE-3,17-DIONE DERIVATIVES

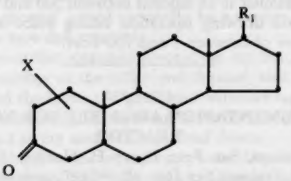
Alfred Weber; Mario Kennecke; Rudolf Müeller; Ulrich Eder, and Rudolf Wiechert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Dec. 17, 1976, Ser. No. 751,672
Claims priority, application Germany, Dec. 19, 1975, 2558089
Int. Cl.[2] C07B *29/00*
U.S. Cl. 195—51 G 10 Claims

1. A process for the preparation of an androstane-3,17-dione compound of the formula



wherein X is 1,2-methylene or 1- or 2-methyl, comprising fermenting; in the absence of 4 androstene-3,17-dione degradation inhibitors, a sterol of the formula



wherein X is as above and R_1 is a saturated or unsaturated hydrocarbon sterol side chain of 8–10 carbon atoms with a micro-organism culture capable of degrading the sterol side chain.

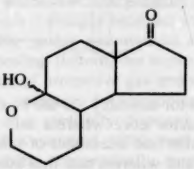
4,097,335

MICROBIAL TRANSFORMATION OF STEROIDS

Thomas R. Pyke, Portage, and Marion P. Salmond, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 14, 1977, Ser. No. 768,025
Int. Cl.[2] C07B *29/02*
U.S. Cl. 195—51 S 17 Claims

1. A process for preparing a compound of the formula



I

which comprises cultivating Mycobacterium fortuitum NRRL B-8129 in an aqueous nutrient medium at a pH of 3.0 to 6.0 under aerobic conditions in the presence of a steroid with or without a 17-alkyl side chain containing from 2 to 10 carbon atoms, inclusive and recovering said compound from the cultivated medium.

4,097,336
REAGENT SYSTEM FOR BETA-AMYLASE ASSAY

Kenneth J. Pierre; Ker-Kong Tung, and Henriette Nadj, all of Vista, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 657,976, Feb. 13, 1976, Pat. No. 4,036,697. This application Jan. 11, 1977, Ser. No. 758,518

Int. Cl.[2] G01N *33/00*

U.S. Cl. 195—99 **6 Claims**

1. A reagent system for a beta-amylase assay comprising:

(a) a polysaccharide having glucose molecules primarily connected through alpha 1,4 linkages;

(b) phosphate ions;

(c) maltose phosphorylase;

(d) a co-enzyme selected from a group consisting of β-nicotinamide-adenine dinucleotide, β-nicotinamide-adenine dinucleotide phosphate, and mixtures thereof;

(e) glucose-6-phosphate dehydrogenase;

(f) β-D-phosphoglucomutase; and

(g) mutarotase;

wherein the above are present in amounts such that the beta-amylase to be assayed is rate-limiting.

4,097,337
BACTERIAL CULTURE MEDIUM

Thomas Anthony Krenitsky, Chapel Hill, and Stanley Robert Morris Bushby, Durham, both of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jan. 27, 1976, Ser. No. 652,770

Claims priority, application United Kingdom, Jan. 27, 1975, 3445/75

Int. Cl.[2] C12K *1/10*

U.S. Cl. 195—100 **7 Claims**

1. A composition which is usable for testing the susceptibility of bacteria to anti-folate agents comprising a bacterial growth medium in combination with purified thymidine phosphorylase enzyme of bacterial origin wherein the concentration of thymidine phosphorylase enzyme in the growth medium is from 2 to 200 units of enzyme activity/ml of medium.

4,097,338
FLUORIMETRIC DEMONSTRATION AND DETERMINATION OF A REDUCED COENZYME OR DERIVATIVE IN AN AQUEOUS SYSTEM

Aarne Ilmari Konttinen, Helsinki, Finland; Bastiaan Cornelis Goverde, and Peter Silvester Lambertus Janssen, both of Oss, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jan. 21, 1976, Ser. No. 651,101

Claims priority, application Netherlands, Jan. 28, 1975, 7500951

Int. Cl.[2] G01N *31/14*

U.S. Cl. 195—103.5 R **7 Claims**

1. A method for the determination of a reduced co-enzyme selected from the group consisting of NADH and NADPH in an aqueous system by fluorometric means, comprising the steps of

preparing an aqueous sample containing said reduced co-enzyme wherein said aqueous sample contains as fluorescence intensifiers therefor (a) a water-miscible organic liquid or a mixture of such liquids, and (b) a dispersion of a water-insoluble material added thereto, said water-insoluble material selected from the group consisting of a metal carbonate, a metal sulphate, a metal phosphate, a metal silicate, a metal oxide, and a protein material obtained by precipitation of a protein in situ by the addition of another protein or a polypeptide to said aqueous sample for the precipitation of said water-insoluble material where no protein, or only enzyme protein, is present, and

measuring specifically the fluorescence of said reduced co-enzyme in said sample.

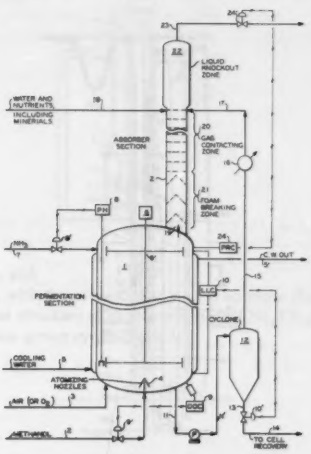
4,097,339
FERMENTATION APPARATUS

Stanley J. Marwil, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 18, 1976, Ser. No. 742,817

Int. Cl.[2] C12B *1/00*

U.S. Cl. 195—142 **10 Claims**



1. A fermentation apparatus for improved oxygen utilization adapted for the continuous aqueous aerobic fermentation of a microorganism, comprising a fermentation section with an upper contiguous absorber section communicating therewith and adapted to the passage of gaseous effluent from the upper area of said fermentation section into the lower portion of said absorber section,

wherein said fermentation section is adapted to contain liquid aqueous ferment and comprises means for receiving a molecular oxygen-containing gas positioned in the lower portion of said fermentation section below the normal liquid level of said aqueous liquid ferment, means adapted for receiving a carbon energy source material and a nitrogen source material,

means for withdrawing aqueous fermentation liquor rich in cellular material from said fermentation section,

means for separating cellular material from said rich aqueous fermentation liquor, leaving lean fermentation liquor,

means for cooling said lean fermentation liquor,

wherein said absorber section comprises, in sequence relative to said fermentation section, a foam-breaking zone, a gas-contacting zone, a liquid knock-out zone of substantially expanded diameter relative to said gas-contacting zone and sufficient to substantially reduce the linear gas velocity of gases exiting said gas-contacting zone, gas-venting means at the upper area of said knockout zone,

means for recycling said cooled lean fermentation liquor to said gas-contacting zone, and

means for feeding make-up water and nutrients to said absorber section.

4,097,340
APPARATUS FOR CLEANING COKE OVEN DOORS

Erich Pries, Bochum, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

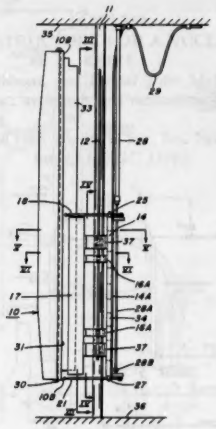
Filed Aug. 24, 1977, Ser. No. 827,286

Int. Cl.[2] C10B *43/08;* B08B *3/02*

U.S. Cl. 202—241 **5 Claims**

1. Apparatus for cleaning the regions of coke oven doors between a surrounding sealing edge and a refractory door plug, comprising a frame vertically reciprocable along the end of a coke oven door which carries said sealing plug, a first pair

of nozzles carried on the upper portion of said frame and arranged to force fluid into the upper portions of those regions of the coke oven door between a surrounding sealing edge and the door plug, and a second pair of nozzles carried on the lower portion of said frame and arranged to force fluid into the lower portions of those regions of the coke oven door between said surrounding sealing edge and the door plug, said nozzles being pivotal about generally vertical axes such that the first



pair of nozzles can be pivoted inwardly when they reach the upper edge of the coke oven door upon upward movement of the frame to clean the region between the upper edge of the door plug and the upper horizontally-extending portion of the sealing edge, the second pair of nozzles being pivotal inwardly when they reach the lower edge of the coke oven door upon downward movement of the frame to clean the region between the lower edge of the door plug and the lower horizontally-extending portion of the sealing edge.

4,097,341

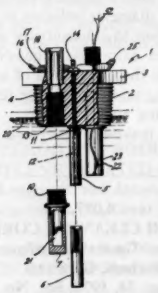
MEASURING CORROSION RATE UNDER SPECIFIED HEAT TRANSFER CONDITIONS

Charles E. Schell, Levittown; Dennis C. Deegan, Glenside, and Donald F. Jacques, Cornwells Heights, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 644,201, Dec. 24, 1975. This application Mar. 7, 1977, Ser. No. 774,723

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—1 T **6 Claims**



1. A method of measuring corrosion rate of a surface which is exposed to a corrodant fluid under specified heat transfer conditions, said method comprising:

inserting probe housing means having a reference electrode, an auxiliary electrode, and a first hollow test electrode at least partially into the fluid, the test electrode containing heat transfer fluid with a heat transfer coefficient similar to that of the test electrode,

heating the first hollow test electrode with electrical heating means having an electrical input, the heating means being at least partially submersed in the heat transfer fluid,

sensing a first temperature of the heat transfer fluid along an inside wall of the heated test electrode,

sensing a second temperature of the corrodant fluid adjacent to an outside wall of the heated test electrode,

instantaneously measuring the corrosion rate of the test electrode using corrosion rate meter means connected to the reference, auxiliary, and heated test electrodes, and

electronically feeding the first and second sensed temperatures and the electrical input to the heating means to a U-meter and instantaneously measuring therein the heat transfer coefficient across the test electrode.

4,097,342

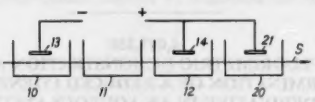
ELECTROPLATING ALUMINUM STOCK

William Ernest Cooke; John Hodgson, both of Kingston, Canada, and Mitsuo Sasaki, Tondabayshi, Japan, assignors to Alcan Research and Development Limited, Montreal, Canada

Continuation of Ser. No. 578,324, May 16, 1975, abandoned. This application Dec. 14, 1976, Ser. No. 750,352

Int. Cl.[2] C25D *5/44, 7/06, 17/00*

U.S. Cl. 204—28 **5 Claims**

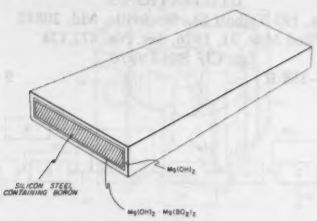


1. A process for the production of metal-plated, elongated aluminum stock which comprises passing the aluminum stock continuously (1) during a minor part of a minute through a hot acid electrolytic cleaning bath containing an electrolyte having a high dissolving power for aluminum oxide, said bath consisting essentially of an aqueous, acid solution selected from the group consisting of: 20 to 50% H_3PO_4 and 10 to 25% H_2SO_4, 75% H_3PO_4 and 5% HNO_3, and 80% by volume H_2SO_4 plus 25 grams per liter CrO_3; and subsequently (2) through an electroplating bath containing a metal plating electrolyte, the first-mentioned bath having a cathode electrode immersed therein and the second-mentioned bath having an anode electrode immersed therein, whereby to render the stock anodic in the first bath; the composition and temperature of the solution of the first bath being sufficient for removal of anodic oxide from the aluminum essentially as rapidly as it forms in the first electrolytic treatment, and said first treatment in the hot acid bath being effective to clean the aluminum during its passage therethrough and to deliver the stock with an essentially bare aluminum surface; and electric current, from a supply, for electrolytic cleaning in the first bath and for plating the stock with metal in the second bath being passed from said anode successively through the second bath, the stock and the first bath, to the cathode, without sliding or rolling contacts between the stock and the electrical supply.

4,097,343
COATED SILICON-IRON PRODUCT AND PROCESS THEREFOR

Ronald H. Arendt, and Matthew J. Curran, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 7, 1977, Ser. No. 774,807
Int. Cl.[2] C25D 5/10, 5/50, 9/04
U.S. Cl. 204—37 R 8 Claims



1. The method of producing grain-oriented silicon-iron sheet which comprises the steps of providing a finegrained primary-recrystallized silicon-iron sheet containing 2.2 to 4.5 percent silicon, between about three and 50 parts per million boron, and between about 15 and 95 parts per million nitrogen in the ratio to boron of one to 15 parts per part of boron, electrolyzing a solid MgO containing aqueous solution consisting essentially of magnesium acetate and magnesium metaborate and containing magnesia with the silicon-iron sheet being arranged as the cathode in said solution and the said solution being at a temperature of at least about 65° C and thereby covering the sheet with a boron-containing adherent electrically-insulating but relatively thin coating of $Mg(OH)_2$, and then electrolyzing a solid MgO-containing aqueous solution consisting essentially of magnesium acetate with the resulting coated sheet arranged as the cathode in the said magnesium acetate solution and thereby covering the boroncontaining $Mg(OH)_2$ coating with a substantially thicker $Mg(OH)_2$ coating, and thereafter subjecting the resulting double-coated sheet to a final heat treatment to develop (110) secondary recrystallization texture in the silicon-iron sheet.

4,097,344
ELECTROCHEMICAL COUPLING OF PERFLUOROALKYL IODIDES

Robert Finley Drury, Roosevelt, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 29, 1976, Ser. No. 700,967
Int. Cl.[2] C25B 3/02
U.S. Cl. 204—59 R 10 Claims

1. A process of preparing perfluoroalkanes comprising anodically coupling at least one compound of the formula $R_f^1R_f^2CFI$ wherein R_f^1 and R_f^2 are each independently fluorine or a perfluoroalkyl radical containing from 4 to 40 carbon atoms in a liquid carboxylic acid in the presence of a small amount of carboxylate ion.

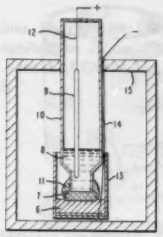
4,097,345
$NA_5GDSI_4O_{12}$ AND RELATED RARE EARTH SODIUM ION CONDUCTORS AND ELECTROLYTIC CELLS THEREFROM

Robert Day Shannon, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 15, 1976, Ser. No. 732,748
Int. Cl.[2] C25D 5/00, 17/00; H01M 4/36; H01B 1/00
U.S. Cl. 204—59 AM 42 Claims

1. The method of conducting sodium ions utilizing a composition having (a) the formula $Na_{5-x}\square_xGd_{1-y-z}M_yM'_xSi_{4-z}Ge_zO_{12}$ wherein

M is yttrium or at least one of the rare earths other than Gd,
M′ is Zr^{4+}, Hf^{4+}, or Th^{4+},
□ is a sodium vacancy to preserve charge neutrality,
x is 0 to about 0.5 when Zr^{4+} or Hf^{4+} is included in M′ and 0 to about 0.1 when Th^{4+} is included in M′,

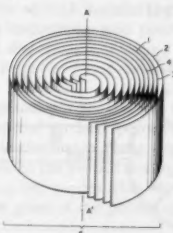


y is 0 to 1, and
z is 0 to 4, with the proviso that $y+x$ is no more than 1, and (b) the crystal structure of the rhombohedral $Na_5YSi_4O_{12}$-type with the space group symmetry $R\bar{3}c$.

4,097,346
ELECTROCHEMICAL OXIDATION OF DIACETONE-L-SORBOSE TO DIACETONE-L-KETOGULONIC ACID

Peter Murday Robertson, 19 Bruttenerstrasse, Oberwil, Switzerland

Continuation-in-part of Ser. No. 559,605, Mar. 18, 1975, Pat. No. 4,040,938. This application Feb. 7, 1977, Ser. No. 766,517
Claims priority, application Germany, Apr. 1, 1974, 2415784; Jan. 30, 1975, 2503819
Int. Cl.[2] C25B 3/02, 3/04
U.S. Cl. 204—80 10 Claims



1. Process for producing diacetone-L-ketogulonic acid by passing a solution of diacetone-L-sorbose through an electrochemical cell, in which said cell includes at least one electrode roll formed by spiralling a deformable sandwich arrangement of electrode layers and spacing layers for preventing direct electrical contact between them, said electrode layers being made of an electrically conductive material, at least one of the spacing layers being ion-permeable and the electrodes and spacing layers having shapes and material structures which cooperate with each other to enable electrolyte flow through said electrode roll or rolls, while applying electrical current whereby to bring about oxidation of said diacetone-L-sorbose at the anode of said electrochemical cell, said anode having an active surface for the said oxidation, and recovering the diacetone-L-ketogulonic acid from said electrolyzed solution.

4,097,347

ELECTROLYTIC RECOVERY OF METALS

Elliot L. Packer, 1015 Prospect Ave., Plainfield, N.J. 07060

Filed Aug. 23, 1976, Ser. No. 716,828
Int. Cl.[2] C25C *1/20*; C25D *5/42*
U.S. Cl. 204—109 **6 Claims**

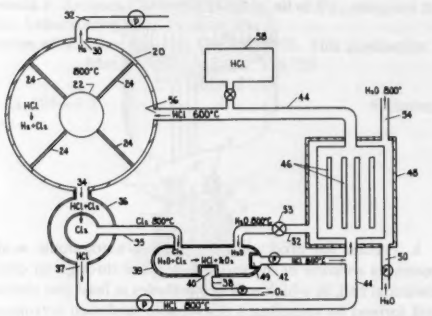
1. A metal recovery process for recovering those precious metals that are soluble in aqua regia from an ionic solution by an electrolytic process comprising the steps of:
selecting a cathode made of a material inert to aqua regia, said cathode being composed of metals from the group consisting of titanium and tantalum,
sand blasting the surface of said cathode,
preplating the surface of said cathode with a thin layer of a conductive adherent metal to provide a coated cathode having a coat that is substantially impervious to hydrogen,
inserting said coated cathode into a solution of a precious metal that is soluble in aqua regia,
electrolytically recovering said precious metal on said cathode, and
dissolving said precious metal and said coat of conductive adherent metal from said cathode by use of aqua regia.

4,097,348

METHOD AND APPARATUS FOR PRODUCING HYDROGEN

Henry J. Gomberg, Ann Arbor, Mich., assignor to Texas Gas Transmission Corporation, Owensboro, Ky.

Continuation of Ser. No. 479,025, Jun. 7, 1974, abandoned. This application Apr. 8, 1976, Ser. No. 675,136
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—157.1 H **12 Claims**



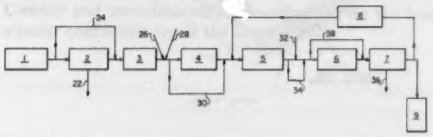
1. A method of producing hydrogen for use as an ingredient of hydrogen based fuels which comprises:
(a) introducing a quantity of gaseous HCl into a first chamber;
(b) subjecting such quantity simultaneously to heat and radiation to dissociate the HCl into H_2 and Cl_2;
(c) separating the gases by removing the H_2 and introducing the hot Cl_2 into a secondary chamber;
(d) introducing H_2O at about 800° C into said secondary chamber to form HCl; and
(e) transferring said HCl to said first chamber and initiating a second and subsequent similar cycles.

4,097,349

PHOTOCHEMICAL PROCESS FOR FOSSIL FUEL COMBUSTION PRODUCTS RECOVERY AND UTILIZATION

Stephen Zenty, 193 Talbott St., Rockville, Md. 20852

Filed Mar. 31, 1976, Ser. No. 672,124
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—158 R **9 Claims**



1. A process for treatment of a gaseous mixture containing NO_x and SO_2 wherein X is 1 or 2, which comprises:
a. addition of reactive olefinic hydrocarbon and oxygen to said mixture in sufficient quantity to form an enriched mixture favorable to free radical formation and photochemical conversion of said NO_x and SO_2,
b. irradiation of said enriched mixture with electromagnetic radiation having a wave length of from about 1500A to about 7500A to form free radicals and produce particulate formation, and
c. separation of particulate material from said irradiated mixture.

4,097,350

ACTINIC RADIATION CURABLE COMPOSITIONS

Stephen D. Pastor, Edison; Martin M. Skoultchi, Somerset, and Henry R. Hernandez, Somerville, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 453,817, Mar. 22, 1974, abandoned. This application Jun. 19, 1975, Ser. No. 588,398
Int. Cl.[2] C08F *2/46*
U.S. Cl. 204—159.23 **9 Claims**

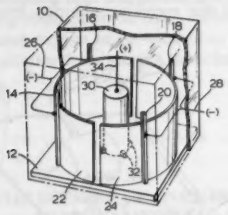
1. An actinic radiation curable prepolymeric composition of matter characterized by the presence of terminal unsaturation consisting essentially of the reaction product of:
(a) from about 1.0 to about 48.0 mole percent of a hydroxyalkyl ester of an alpha, beta unsaturated carboxylic acid, wherein the alkyl group of the ester moiety contains from 2 to 20 carbon atoms, and the acid moiety contains from 3 to 4 carbon atoms;
(b) from about 1.0 to about 48.0 mole percent of at least one polymerizable free-radical initiator activatable by actinic radiation and selected from the group consisting of tetrachlorophthalic anhydride, tetrabromophthalic anhydride and 1,4,5,6,7,7-hexachloro-5-norbornene-2,3-dicarboxylic anhydride and mixtures thereof;
(c) from about 1.0 to about 48.0 mole percent of at least one nonhalogenated cyclic anhydride containing from 4 to 10 carbon atoms; and
(d) from about 1.0 to about 48.0 mole percent of at least one epoxide containing 2 to 8 carbon atoms and selected from the group consisting of epoxyalkyl acrylates and methacrylates and alkylene oxides.

4,097,351

PREPARATION OF METAL ALLOY COATINGS ON IRON SUBSTRATES

William F. Caley, Halifax, and Spero N. Flengas, Willowdale, both of Canada, assignors to The Governing Council of the University of Toronto, Toronto, Canada

Filed Feb. 3, 1977, Ser. No. 765,154
Int. Cl.[2] C25D 13/02
U.S. Cl. 204—181 N 9 Claims



1. A process of applying integrated metallic coatings to ferrous metal substrates, which comprises:

forming a colloidal suspension of at least one metal oxide selected from the group consisting of nickel oxide, chromium oxide and mixtures thereof, in powder form, in an aqueous medium containing suitable dispersant;

immersing in said colloidal suspension a ferrous metal substrate and anodically polarizing the substrate;

electrophoretically depositing a film containing said at least one metal oxide from the colloidal suspension onto said ferrous metal substrate anode;

drying the film deposited on the ferrous metal substrate anode to remove a substantial amount of water therefrom;

and heating the deposited firm containing said metal oxide in the presence of hydrogen at temperatures of from about 1000° C to about 1500° C so as to reduce the deposited metal oxide to metal and form an integrated coating of said metal on said substrate by diffusion.

4,097,352

ELECTRODEPOSITION OF COMPOSITIONS CONTAINING SULFONIUM RESINS AND CAPPED POLYISOCYANATES

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 594,152, Jul. 8, 1975, Pat. No. 4,038,232, which is a continuation of Ser. No. 316,596, Dec. 19, 1972, abandoned. This application Apr. 11, 1977, Ser. No. 786,538
Int. Cl.[2] C25D 13/06
U.S. Cl. 204—181 C 9 Claims

1. A method of coating a conductive substrate serving as a cathode which comprises passing electric current between an anode and said cathode in electrical contact with the water-dispersed composition comprising an aqueous dispersion comprising:

(A) a ternary sulfonium salt group solubilized synthetic organic resin containing free hydroxyl groups, said organic resin produced by reacting:

(1) an epoxy group-containing organic material having a 1,2-epoxy equivalency of greater than 1, and

(2) a sulfide-acid mixture, said sulfide-acid mixture being used in an amount to provide sufficient quaternary sulfonium groups to solubilize said resin, said sulfide being selected from the group consisting of aliphatic, mixed aliphatic-aromatic, aralkyl and cyclic sulfides; and

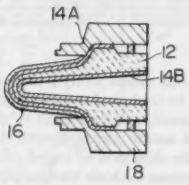
(B) a capped, organic polyisocyanate stable at ordinary room temperature in the presence of said resin (A) and reactive with said resin (A) at elevated temperatures.

4,097,353

ARTICLE AND METHOD OF FORMING POROUS COATING ON ELECTRODE LAYER OF CONCENTRATION CELL TYPE OXYGEN SENSOR

Katsuhiro Kishida, Yokohama; Hiroshi Takao, Kamakura; Kimmochi Togawa, and Kazuo Matoba, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 10, 1976, Ser. No. 694,698
Claims priority, application Japan, Jun. 10, 1975, 50-69173
Int. Cl.[2] G01N 27/26
U.S. Cl. 204—195 S 9 Claims



1. A method of forming a porous coating on an electrode layer of an oxygen sensor, said sensor comprising a layer of a solid oxygen-ion electrolyte for use in a combustion engine exhaust gas, said layer of said solid electrolyte having first and second sides and having first and second electrode layers formed on said first and second sides respectively; said first electrode layer being in communication with said exhaust gases, said second layer being in communication with a reference gas, said porous coating being formed only on said first electrode layer which is exposed to, and in communication with, said exhaust gases, said method comprising the steps of:

applying fine particles of a heat-resistant and chemically stable first material onto the surface of the electrode layer to form a porous layer by plasma-spraying said fine particles, said first material being selected from the group consisting of alumina, spinel, alumina cement, beryllia, zirconia, nickel oxide, silicon carbide, boron carbide and boron nitride;

applying a dispersion of fine particles of a heat-resistant and chemically stable second material in a liquid onto said porous layer to impregnate said porous layer with said dispersion, said dispersion containing at least one compound selected from the group consisting of alumina and silica; and

baking the impregnated porous layer to fix said particles of said second material to said porous coating, said fine particles and said dispersion being applied such that the total pore volume in the porous coating after the completion of the baking step ranges from between about 0.09 to 0.16 cm^3 per one gram of the porous coating.

4,097,354

CONTINUOUS PROCESS FOR ELECTROLYTIC REFINING AND ELECTROWINNING OF ELEMENTS AND COMPOUNDS

Marco V. Ginatta, Corso Alberto Pico, 35, Turin, Italy

Filed May 11, 1976, Ser. No. 685,305
Claims priority, application Italy, May 12, 1975, 68194 A/75; Apr. 26, 1976, 68012 A/76
Int. Cl.[2] C25C 1/12, 1/18, 7/02
U.S. Cl. 204—206 16 Claims

1. An apparatus for the continuous electrolytic refining and extraction of metals, metalloids, elements, compounds and alloys, which comprises:

a tank;

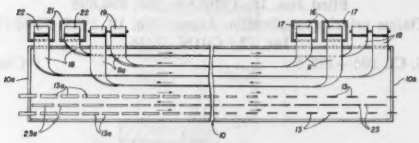
an electrolyte, contained within said tank;

continuous cathode means;

continuous anode means;

first transfer means for supporting and moving said continuous cathode means along a predetermined path between one end of said tank and an opposite end of said tank, said continuous cathode means being at least partially submersed in said electrolyte between said ends of said tank; and

second transfer means for supporting and moving said continuous anode means along a path within said tank which is parallel to said predetermined path of said continuous cathode means, wherein each submersed portion of said continuous anode means moves in a direction of travel opposite the direction of travel of an adjacent portion of said continuous cathode means, between said ends of said tank, said anode means being at least partially submersed in said electrolyte.



4,097,355

WATER STERILIZATION APPARATUS

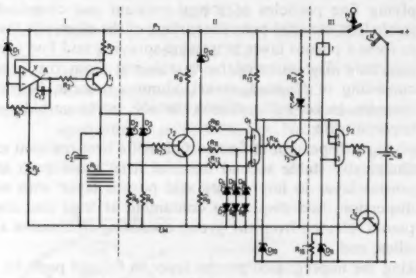
Wolfgang Fischer, Konigsburg, Germany, assignor to Sachs Systemtechnik, Schweinfurt am Main, Germany

Filed Jun. 8, 1977, Ser. No. 804,559

Claims priority, application Germany, Jun. 14, 1976, 2626570

Int. Cl.[2] C02B *1/82; C25B 15/00*

U.S. Cl. 204—228 **12 Claims**



1. Water sterilization apparatus, comprising in combination, a water purification cell having an internal resistance varying as a function of the conductivity of water passing therethrough, said purification cell being effective only when the voltage thereacross has an amplitude in a range between a predetermined minimum amplitude and a predetermined maximum amplitude and requiring a substantially constant current for proper sterilization of said water; a constant current source connected to said water purification cell for furnishing said constant current; and monitoring means for monitoring the voltage across said water purification cell and furnishing a fault signal when said voltage is outside said range.

4,097,356

CHLORINE GENERATOR

Dow Yates, 212 Westwood Dr., Friendswood, Tex. 77546

Filed Sep. 8, 1977, Ser. No. 831,485

Int. Cl.[2] C25C *7/00*

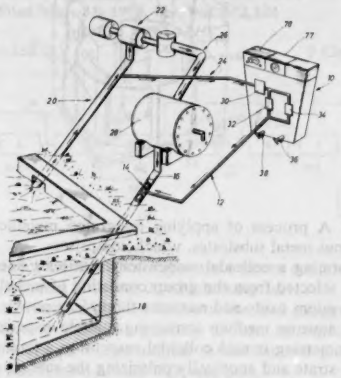
U.S. Cl. 204—237 **9 Claims**

1. A chlorine generator comprising:

a. a housing with separate anode and cathode compartments containing, respectively, an anode and cathode electrode therein, said housing separated by a fluorinated polymeric ion-permeable membrane to define said anode and cathode compartments, with said anode compartment adapted for receiving sodium chloride and water and said cathode compartment adapted for receiving water;

b. a timer electrically connectable to an external power source for timing activation of said generator and further connected to a power supply for controlling the passage of a direct current through said electrodes;

c. a chlorine aspirator in communication with said anode compartment for receiving chlorine generated in said anode compartment and a hydrogen aspirator in communication with said cathode compartment for receiving hydrogen generated in said cathode compartment;



d. a conduit in fluid communication with said chlorine aspirator and said hydrogen aspirator;

e. a pressure gauge in said anode compartment for measuring the gas pressure of the chlorine produced by said chlorine generator, with said pressure gauge electrically connected to said power supply and operable in response to a chlorine pressure below a predetermined level to deactivate said generator.

4,097,357

METHOD AND DEVICE FOR REGENERATING ZINC

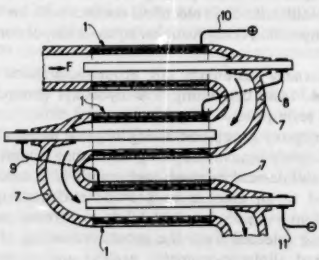
Jean Jacquelin, Marolles en Hurepoix, France, assignor to Compagnie Generale d'Electricite S.A., Paris Cedex, France

Filed Jul. 21, 1976, Ser. No. 707,732

Claims priority, application France, Jul. 21, 1975, 75 22661; Dec. 3, 1975, 75 36967; Jun. 3, 1976, 76 16842; Jun. 3, 1976, 76 16843; Jun. 9, 1976, 76 17455

Int. Cl.[2] C25C *1/16, 7/02*

U.S. Cl. 204—252 **22 Claims**



1. A device for regenerating zinc from an alkaline zincate solution, said device comprising: a duct, a negative electrode disposed substantially along the axis of said tubular duct, means

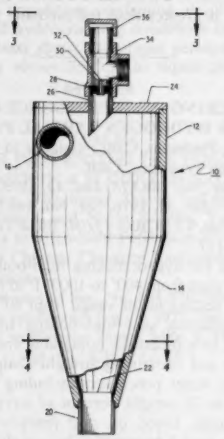
for conveying said solution for regeneration within said duct, said duct being constructed from a porous insulating hydrophilic material to allow the alkaline solution to infiltrate but preventing zinc particles dissociated from the negative electrode from passing therethrough; a positive electrode disposed in the form of a layer on the outer surface of the tubular duct, said positive electrode being constructed from a porous conductive material containing inter alia nickel to cause oxygen to be released to the exterior; and a layer of a porous water-repellent material containing inter alia porous sintered polytetrafluoroethylene being disposed on the outer surface of the positive electrode, to cause oxygen to be released to the exterior but preventing the solution from seeping therethrough.

4,097,358

APPARATUS FOR RELEASE OF AN ENTRAINED GAS IN A LIQUID MEDIUM

Russell M. Wiseman, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Aug. 30, 1976, Ser. No. 718,833
Int. Cl.[2] C25B *9/00*; B01D *47/00*
U.S. Cl. 204—270 **8 Claims**



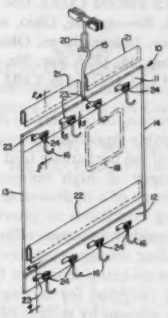
1. A device for the release of an entrained gaseous substance from a liquid comprising: a cylindrical top section; a conical bottom section attached to said cylindrical top section at the larger diameter conjugate plane of said conical bottom section which is equal in diameter to said cylindrical top section; a feed line for the liquid near the top of said cylindrical top section and attached thereto in a tangential fashion so as to communicate with the interior of the device; a planar top attached to the top of said cylindrical top section; tubing extending through said planar top so as to communicate with the interior of the device; at the exterior end of said tubing, a plug sealingly engaged therein with the center drilled and tapped to receive an orifice containing bolt; said bolt having a gas release orifice of sufficient size as to allow the escape of the gaseous substance while severely restricting the flow of the liquid therethrough; an outlet for the liquid of the same diameter as the feed line attached to said conical bottom section at the smaller diameter conjugate plane of said conical bottom section which is equal to the diameter of said outlet to communicate with the interior of the device; and a planar baffle attached to the interior wall of said outlet so as to protrude slightly into said conical bottom section for arresting the circular motion of the liquid.

4,097,359

WORKPIECE-SUPPORTING RACK

Walter E. Davitz, Columbus, Ohio, assignor to White Castle System, Inc., Columbus, Ohio

Filed Jun. 24, 1977, Ser. No. 809,904
Int. Cl.[2] B05C *11/00*; C25D *17/08*; A47F *5/08*; B05C *11/16*
U.S. Cl. 204—297 W **3 Claims**



1. A rack supporting workpieces during coating operations comprising:

(a) an essentially open border frame of electrically conductive material including at least one transverse member provided with relatively spaced apart, hookreceiving socket means thereon;

(b) a plurality of electrically conductive, workpiece-supporting hooks detachably and electrically engaged with the socket means of the transverse member of said frame;

(c) removable cover means for covering the engaged portions of said hooks and socket means; and

(d) an electrically conductive connector carried by said frame for suspending it from and establishing electrical connection with an overhead carrier.

4,097,360

QUENCHING PYROLYSIS REACTOR EFFLUENT STREAMS

Stuart Sack, Upland, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jun. 25, 1976, Ser. No. 700,047
Int. Cl.[2] C10G *11/02*
U.S. Cl. 208—8 **16 Claims**

1. A continuous process for recovery of values contained in a feed stream containing a solid carbonaceous material comprising the steps of:

(a) directly contacting under turbulent flow conditions in a cocurrent, entrained flow quench zone at least a portion of the feed stream with a stream containing volatilized hydrocarbons resulting from pyrolysis of the solid carbonaceous material to simultaneously preheat the feed stream and rapidly quench the volatilized hydrocarbons;

(b) separating a stream containing the preheated solid carbonaceous material from the volatilized hydrocarbons;

(c) pyrolyzing the stream containing preheated solid carbonaceous material in a pyrolysis zone maintained at a temperature higher than the temperature of the quench zone by contact with a particulate solid source of heat to yield a pyrolysis product stream containing condensible volatilized hydrocarbons and a carbon containing particulate solid residue;

(d) separating volatilized hydrocarbons from the carbon containing particulate solid residue;

(e) passing at least a portion of the separated volatilized hydrocarbons to the quench zone to directly contact carbonaceous material in the feed stream;

(f) withdrawing at least a portion of the carbon containing particulate solid residue as product; and
(g) separating values from the volatilized hydrocarbons by condensing hydrocarbons therefrom.

4,097,361

PRODUCTION OF LIQUID AND GASEOUS FUEL PRODUCTS FROM COAL OR THE LIKE

Robert A. Ashworth, Strongsville, Ohio, assignor to Arthur G. McKee & Company, Independence, Ohio

Filed Aug. 24, 1976, Ser. No. 717,102
Int. Cl.[2] C10G *1/08;* C10J *3/62*
U.S. Cl. 208—10 **26 Claims**

1. A multistage process for conversion of solid carbonaceous feed material to valuable liquid and gaseous products comprising passing a slurry of the particulate feed in a hydrocarbon oil solvent with hydrogen at high temperature and pressure through a reaction zone of a hydroextraction unit maintained under hydrocracking conditions to provide for coal dissolution, withdrawing liquid and gaseous effluent streams from the reaction zone including unconverted feed material, a fraction comprising a solvent oil being separated from the liquid effluent and continually recycled for mixing with the incoming particulate feed, the amount by weight of recycled solvent oil being greater than the amount of particulate feed and sufficient to dissolve most of the particulate feed, feeding that portion of the effluent stream from said hydroextraction unit containing the heavier oils and unconverted feed material to the reaction zone of a pyrolysis unit containing a fluidized bed of char and agglomerated ash particles to effect thermal cracking, withdrawing oil and gas from the residue of char and ash produced in said pyrolysis unit, feeding the char and agglomerated ash from said pyrolysis unit to the reaction zone of an ash-agglomerating char gasification unit and reacting it with an oxygen-containing gas and steam exothermically to produce fuel gas while generating heat and causing agglomeration of ash particles, and recycling the hot agglomerated ash from said gasification unit to the reaction zone of said pyrolysis unit to transfer heat to said reaction zone and to catalyze the cracking reactions therein.

4,097,362

METHOD FOR ENHANCING DISTILLATE LIQUID YIELD FROM AN ETHYLENE CRACKING PROCESS

Joel Drexler McKinney; Raynor T. Sebulsky, both of Pittsburgh, and Francis Edmund Wynne, Jr., Allison Park, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jul. 12, 1976, Ser. No. 704,392
Int. Cl.[2] C10G *37/02, 9/32;* C07C *11/04*
U.S. Cl. 208—78 **8 Claims**

1. A combination catalytic and thermal cracking process comprising catalytically cracking a relatively high boiling relatively high sulfur hydrocarbon feed oil comprising a 650° F.+ heavy gas oil or residual oil in the presence of entrained zeolite cracking catalyst at a temperature between about 900° and 1,100° F. and recovering catalytically cracked effluent including catalytically cracked liquid product, separating said catalytically cracked liquid product into a catalytically cracked residue liquid containing slurried catalyst particles and a catalytically cracked distillate liquid; thermally and non-catalytically cracking a lower boiling and lower sulfur hydrocarbon feed oil to produce ethylene in the presence of entrained catalytically inert hot solids and a gaseous diluent at a temperature between about 1,300° and 2,500° F. and recovering a thermally cracked effluent including gaseous products and thermally cracked liquid product, injecting said catalytically cracked residue liquid containing slurried catalyst particles into said thermally cracked effluent to thermally quench said thermally cracked effluent, recovering coke-laden solids from said thermally cracked effluent, passing said coke-laden solids to a coke burner, separating said thermally cracked liquid product into a thermally cracked residue liquid containing catalytically cracked residue liquid and slurried solids and a thermally cracked distillate liquid; and passing said thermally cracked residue slurry liquid containing catalytically cracked residue liquid and slurried solids to said coke burner for combustion as burner fuel.

4,097,363

THERMAL CRACKING OF LIGHT GAS OIL AT HIGH SEVERITY TO ETHYLENE

Joel Drexler McKinney; Raynor T. Sebulsky, both of Pittsburgh, and Francis Edmund Wynne, Jr., Allison Park, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jul. 12, 1976, Ser. No. 704,465
Int. Cl.[2] C10G *37/02, 9/32;* C07C *11/04*
U.S. Cl. 208—78 **19 Claims**

1. A process for producing ethylene by thermally cracking a hydrocarbon feed at least 90 volume percent of which comprises a light gas oil fraction of a crude oil boiling between 400° and 650° F. comprising passing said hydrocarbon feed, a diluent gas, and entrained inert hot solids through a cracking zone at a temperature between 1,300° and 2,500° F. for a residence time of 0.05 to 2 seconds, the weight ratio of diluent gas to feed oil being at least 0.3, the cracking severity corresponding to a methane yield of at least 12 weight percent based on said feed oil, and quench cooling said product immediately upon leaving said cracking zone to a temperature below 1,300° F. so that the ethylene yield is greater than the methane yield on a weight basis.

4,097,364

HYDROCRACKING IN THE PRESENCE OF WATER AND A LOW HYDROGEN PARTIAL PRESSURE

Clark J. Egan, Piedmont, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 586,673, Jun. 13, 1975. This application Mar. 24, 1976, Ser. No. 669,779
Int. Cl.[2] C10G *13/04;* B01J *11/40*
U.S. Cl. 208—111 **5 Claims**

1. A process for hydrocracking high-boiling hydrocarbons boiling in the range from 400° to 1000° F to form lower-boiling hydrocarbons boiling in the range from 80° to 700° F, which comprises contacting said high-boiling hydrocarbons, in a reaction zone, in a feedstock containing from 4 to 15 weight percent water and containing straight-chain olefins and oxygen-containing water precursors including CO and CO_2 and from about 1 to 20 weight percent of oxygen-containing organic compounds, based on said feedstock, said feedstock containing less than 5 ppm sulfur, by weight, and greater than 55 weight percent of water and oxygen-containing water precursors, with a hydrocracking catalyst including a Group VIB or Group VIII metal supported on a refractory cracking base at hydrocracking conditions including a partial pressure of hydrogen of from 50 to 450 psi and a temperature of from 450° to 750° F, to convert 75 to 99 percent of said oxygen-containing organic compounds to hydrocarbons, to convert said high-boiling hydrocarbons to said lower-boiling hydrocarbons, and to convert a substantial portion of said straight-chain olefins to isoparaffins and paraffins.

4,097,365

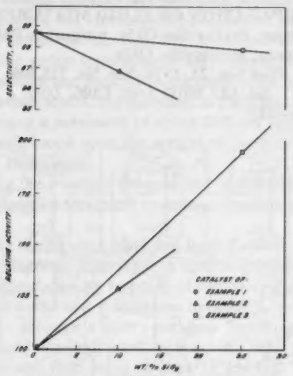
HYDROCRACKING PROCESS AND CATALYST FOR PRODUCTION OF MIDDLE DISTILLATE OILS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 668,039, Mar. 18, 1976, Pat. No. 4,062,809. This application Mar. 28, 1977, Ser. No. 781,536
Int. Cl.[2] C10G *13/06;* B01J *27/04*
U.S. Cl. 208—111 **8 Claims**

1. A process for hydrocracking a mineral oil feedstock boiling predominantly above about 700° F to produce a middle distillate product boiling in the range of about 300°–700° F,

which comprises contacting said feedstock plus added hydrogen, and under hydrocracking conditions, with a catalyst comprising a molybdenum and/or tungsten first component plus a nickel and/or cobalt second component supported on a heterogeneous support consisting essentially of about 10–50 weight-percent of a finely divided cracking component dispersed in an



alumina matrix, said cracking component being a silica-alumina cogel or copolymer containing about 50–96 weight-percent SiO_2, said hydrocracking conditions being correlated so as to give at least about 50 volume percent conversion of feedstock boiling above 700° F to liquid products boiling below 700° F.

4,097,366
METHOD FOR PREVENTING THE FORMATION OF COKE DEPOSITS IN A FLUIDIZED BED REACTOR

Tsunemitsu Tanaka, Yokohama; Tetsuo Nakagawa, Fujisawa; Shiro Abiko, Tokyo, and Norio Kaneko, Yokohama, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo and Chiyoda Chemical Engineering & Construction, both of, Japan

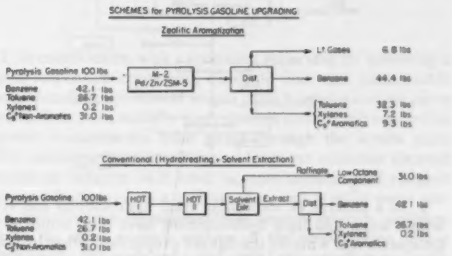
Continuation-in-part of Ser. No. 666,070, Mar. 11, 1976, abandoned. This application Sep. 8, 1977, Ser. No. 831,673
Claims priority, application Japan, Mar. 1, 1975, 50-28681
Int. Cl.² C10G *11/18*
U.S. Cl. 208—127 **5 Claims**

1. In the process of thermally cracking a heavy hydrocarbon oil by feeding said oil into a fluidized bed reactor as a high-velocity atomized gas stream by blowing said oil therein from a gas-mixing type nozzle along with an atomizing gas and carrying out the thermal cracking of the oil at above 500° C in the substantial absence of oxygen, said fluidized bed containing heat transfer particles therein fluidized by means of a fluidizing gas, the improvement which comprises blowing in a particle-free inert gas to the eddying part formed in the environs of said atomized gas steam in said fluidized bed reactor at a velocity sufficient to block the formation of eddies, thereby preventing the accumulation of coke deposits on the outside wall of said nozzle and the walls of the fluidized bed reactor in the vicinity of said nozzle, said heavy hydrocarbon oil, atomizing gas and particle-free inert gas being introduced into the fluidized bed reactor at a point above the point wherein the fluidizing gas is introduced into the reactor.

4,097,367
CONVERSION OF OLEFINIC NAPHTHA

Werner O. Haag, Lawrenceville, and Tracy J. Huang, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,632
Int. Cl.² C10G *35/06*
U.S. Cl. 208—135 **8 Claims**



1. A process for upgrading of pyrolysis gasoline and other olefinic naphthas which contain olefins which comprises contacting said naphtha at severe conditions of 900° to 1200° F, a pressure of atmospheric to 400 pounds per square inch and weight hourly space velocity of 0.3 to 30 with a catalyst composite of zinc and at least one metal selected from the groups consisting of IB and VIII of the Periodic Table in intimate association with a porous crystalline aluminosilicate zeolite having a silica to alumina ratio of at least 12 and a constraint index between 1 and 12.

4,097,368
HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

John C. Hayes, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

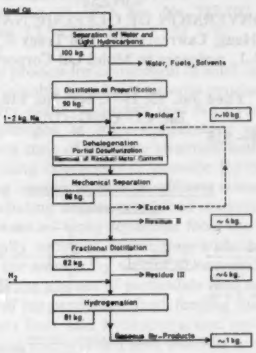
Continuation-in-part of Ser. No. 576,924, May 12, 1975, Pat. No. 3,998,724. This application Oct. 18, 1976, Ser. No. 734,473
Int. Cl.² C10G *35/08, 13/02;* C07C *5/28;* B01J *11/08*
U.S. Cl. 208—139 **24 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 2.5 wt. % nickel, about 0.05 to about 5 wt. % cobalt and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, nickel, and catalytically available cobalt are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal and nickel are present in the elemental metallic state; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,097,369
PROCESS FOR RECLAIMING USED HYDROCARBON OILS

Eckhard Ebel; Hans-Rudolf Kobel, and Ernst Widmer, all of Bern, Switzerland, assignors to Adolf Schmids Erben Aktiengesellschaft, Bern, Switzerland

Filed Feb. 27, 1976, Ser. No. 661,857
Claims priority, application Germany, Feb. 28, 1975, 2508713
Int. Cl.[2] C10M *11/00*
U.S. Cl. 208—180 17 Claims

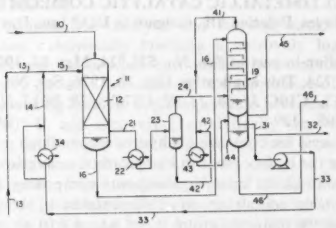


1. In a process of reclaiming used hydrocarbon oils from which water and light hydrocarbons have been removed by distillation and wherein the oils are prepurified either by coagulation, adsorption, a combination of coagulation and adsorption, by filtration, or by vacuum distillation, with subsequent fractional distillation and after-treatment, the improvement which comprises subjecting the prepurified product to dehalogenation, partial desulfurization, and removal of residual metal contents prior to the fractional distillation and after-treatment by contacting said prepurified oil with an agent selected from the group consisting of alkali metals and alkali metal hydrides.

4,097,370
HYDROTREATING OF PYROLYSIS GASOLINE

Ari A. Minkkinen, Mountain Lakes, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Apr. 14, 1977, Ser. No. 787,506
Int. Cl.[2] C10G *23/00*
U.S. Cl. 208—255 7 Claims



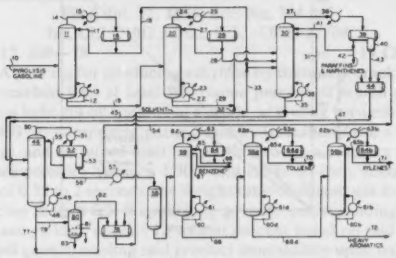
1. In a process for hydrotreating pyrolysis gasoline wherein fresh feed pyrolysis gasoline, hydrogen-containing gas and recycle hydrotreated effluent are contacted in a hydrotreating zone, a hydrotreated effluent is withdrawn from the hydrotreating zone and a portion of the hydrotreated effluent is recycled to the hydrotreating zone, the improvement comprising:

operating said hydrotreating zone at a total pressure of from 200 to 400 psig and a log mean hydrogen partial pressure of from 135 to 260 psig; and separating from at least said portion of the hydrotreated effluent recycled to the hydrotreating zone, at least 5 mole percent of C_5 and lighter hydrocarbons to provide in said hydrotreating zone said log mean hydrogen partial pressure at said total pressure.

4,097,371
SEPARATION OF FLUID MIXTURES

Victor A. Giroux, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 21, 1976, Ser. No. 725,306
Int. Cl.[2] B01D *3/40;* C10G *7/00*
U.S. Cl. 208—313 9 Claims



1. A method of separating a pyrolysis gasoline which contains benzene, toluene, xylenes, paraffins and naphthenes, which method comprises:

fractionating the pyrolysis gasoline to obtain a first stream rich in benzene, a second stream rich in toluene and a third stream rich in xylenes, the amounts of paraffins and naphthenes in said streams being determined by the boiling points of the paraffins and naphthenes;

passing said first stream to an extractive distillation column at a first location intermediate the top and bottom thereof;

passing said second stream to said extractive distillation column at a second location intermediate the top and bottom thereof, said second location being above said first location;

passing said third stream to said extractive distillation column at a third location intermediate the top and bottom thereof, said third location being above said first and second locations;

introducing into said extractive distillation column at a location above said third location a solvent which selectively absorbs aromatics in preference to paraffins and naphthenes;

withdrawing a raffinate stream from said extractive distillation column, said raffinate stream containing a major portion of the paraffins and naphthenes present in said pyrolysis gasoline; and

withdrawing an extract stream from said extractive distillation column, said extract stream containing a major portion of the benzene, toluene and xylenes present in said pyrolysis gasoline.

4,097,372
METHOD FOR IMPROVING CLAY BRIGHTNESS UTILIZING MAGNETIC SEPARATION

Alan J. Nott, Crantock near Newquay, England, assignor to Anglo-American Clays Corporation, Sandersville, Ga.

Continuation-in-part of Ser. No. 513,154, Oct. 8, 1974, Pat. No. 3,974,067. This application Jul. 8, 1976, Ser. No. 703,566
The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.
Int. Cl.[2] B03B *1/00*
U.S. Cl. 209—3 8 Claims

1. A method for brightening a kaolin clay comprising:

forming an aqueous dispersion of said clay and blunging and

conditioning said dispersion to dissipate at least 10 hp-hrs of energy per ton of solids, at least said conditioning step being conducted in the presence of a collector agent comprising a complex phosphate ester or salt thereof, of a non-ionic surface active compound; said phosphate ester being selected from the group of mono-esters, di-esters, and mixtures thereof; said non-ionic surface active compound being the condensation product of an organic hydroxy compound of from 8 to 50 carbon atoms selected from the group consisting of alkyl phenols and alkanols with at least one mole of an alkylene oxide having from 2 to 3 carbon atoms, the non-ionic surface active compound containing a maximum of about 50% by weight of alkylene oxide based upon the weight of the non-ionic surface active compound;

subjecting the resultant blunged and conditioned slurry to a froth flotation treatment to remove titaniferous impurities; and

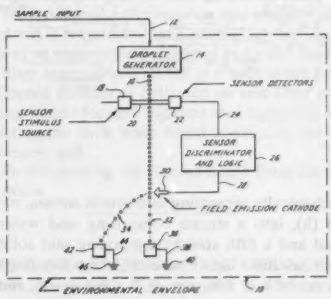
subjecting the product from said froth flotation treatment to a wet magnetic separation to further increase the brightness of said clay by removal of discoloring contaminants in addition to said titaniferous impurities, by passing said product through a slurry-pervious ferromagnetic matrix positioned in a high intensity magnetic field, the retention time in said field being at least 15 seconds, and the said field being maintained at an average field intensity of from 7 to 22 kg.

4,097,373

HIGH SPEED PARTICLE SORTER USING A FIELD EMISSION ELECTRODE

John Caldwell Allred, 1300 Antigua La., Houston, Tex. 77058

Filed Mar. 23, 1977, Ser. No. 780,281
Int. Cl.[2] B07C *5/342*
U.S. Cl. 209—111.5 **13 Claims**



1. An apparatus for analyzing and sorting small particles on the basis of preselected parameters of combinations of preselected parameters comprising

generating means for segregating one of said particles in at least one liquid droplet;

sensing means downstream of said generating means for sensing the presence and absence of said preselected parameter of said particle;

flow means for passing said particles from said generating means to close proximity of a field emission cathode, said cathode being located downstream of said sensing means;

discrimination means responsive to said sensing means and functionally connected to said field emission cathode for selectively establishing a high potential electric field on said field emission cathode when said particle is closely adjacent said cathode if said sensed particle displays said preselected parameter; and

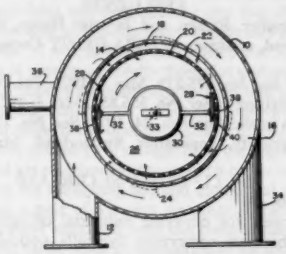
collection means located downstream of said field emission cathode for receiving said particles.

4,097,374

SCREENING APPARATUS HYDROFOIL

Douglas Leonard Young, Lennoxville, Canada, assignor to Canadian Ingersoll-Rand Co. Ltd., Montreal, Canada

Filed Jan. 26, 1977, Ser. No. 762,475
Int. Cl.[2] B07B *1/52*
U.S. Cl. 209—379 **4 Claims**



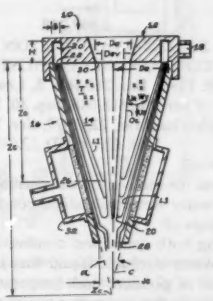
1. In combination with a screening apparatus for screening a liquid suspension containing desirable fiber and undersirable contaminants: a cylindrical screen plate having a curved outer feed surface and a radially inner accepts surface and adapted to prevent contaminants from going through the screen plate while passing acceptable fibers; at least one rotatable element positioned adjacent said inner accepts surface; said element having a leading edge, a trailing edge, and a radial outer surface comprising a circumferentially curved portion conforming to the inner accepts surface of the screen plate, and a substantially flat surface on said radial outer surface and radially inward from said curved portion, said curved portion and said substantially flat portion being interconnected by a wall and said substantially flat surface extending to the leading edge of the element; and means for rotating the element in a position close enough to the inner accepts surface of the screen plate to minimize the possibility of fibers or contaminants wedging between the curved portion of the element and the screen plate.

4,097,375

HYDROCYCLONE SEPARATOR

Arvid A. Molitor, Elgin, Ill., assignor to Luhring Chicago Industries, Des Plaines, Ill.

Filed Jan. 31, 1977, Ser. No. 763,808
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—23 H **10 Claims**



1. A method for separating a solvent from a solute, the improvement comprising introducing solute-containing solvent in tangential manner into a conical chamber adjacent the base thereof, to impart a spiral path of flow to said solute-containing solvent, and passing said spirally moving solute-containing solvent over porous media defining at least a portion of

said conical chamber, and passing solvent outwardly through said porous media for separation from solute said porous media being of the type to permit the flow of solvent therethrough while preventing the passage of said solute.

4,097,376

PROCESS FOR THE PURIFICATION OF INDUSTRIAL EFFLUENTS

Hans Wegmuller, Riehen, and Jaroslav Haase, Basel, both of Switzerland, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

Division of Ser. No. 575,279, May 7, 1975, Pat. No. 4,025,428, which is a division of Ser. No. 356,853, May 3, 1973, abandoned. This application Feb. 24, 1977, Ser. No. 771,596

Claims priority, application Switzerland, May 10, 1972, 00712/72

Int. Cl.[2] C02B *1/60;* **C02C** *5/08*

U.S. Cl. 210—36 **8 Claims**

1. A process for purifying industrial effluents containing residual substances comprising dyestuffs, optical brighteners, dyeing auxiliaries, detergents, tanning agents or mixtures thereof, which comprises bringing said effluents into contact with a cellulosic absorbent pretreated with

(a) a water soluble basic aminoplast, and

(b) a polyanionic polymer.

4,097,377

METHOD OF PURIFICATION OF WASTE WATER BY TREATMENT WITH ZIRCONIUM SALT

Buichiro Ayukawa, Musashino, Japan, assignor to Shikoku Paper Mfg. Co., Ltd., Japan

Division of Ser. No. 519,866, Nov. 1, 1974, Pat. No. 3,997,439. This application Dec. 22, 1975, Ser. No. 643,499

Claims priority, application Japan, Nov. 7, 1973, 48-125118

The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.

Int. Cl.[2] C02C *5/04;* **C02B** *1/20*

U.S. Cl. 210—50 **32 Claims**

1. A method of purification of waste water containing sewage including living sewage, food sewage, foam forming detergents, phosphates, carboxymethyl cellulose, lignin, sewage from mines, a dye, clay and colloidal aluminum, comprising coagulating and precipitating suspended substances and colloidal dispersed particles, and precipitating non-colloidal dissolved, low molecular weight, substances by adding an aqueous solution of $ZrOCl_2.8H_2O$ to the said waste water, adjusting the pH to 4.5-6.8 to form water insoluble precipitates or chelates thereof and removing said precipitates and chelates.

4,097,378

MULTIPLE EFFECT EVAPORATION OF WATER FROM WATER CONTAINING COMBUSTIBLE SLUDGES

John Craig St. Clair, Box 216 Rte. 5, London, Ohio 43140

Continuation of Ser. No. 618,048, Sep. 30, 1975, abandoned. This application Mar. 22, 1977, Ser. No. 780,064

Int. Cl.[2] B01D *12/00*

U.S. Cl. 210—67 **4 Claims**

1. A process for recovering combustible solids of vegetable origin from water wet combustible concentrated solids, comprising the steps of:

(a) pumping both water wet combustible solids and a preheated water insoluble liquid that is also a liquid at the condition of pressure and temperature in each of steps mentioned in this claim to a vapor and liquid contacting vessel,

(b) feeding a stream containing steam to said vapor and liquid contacting vessel and mechanically mixing the steam just mentioned and the concentrated solids and the water insoluble liquid mentioned in step (a),

(c) withdrawing at least a first stream comprising water, said water insoluble liquid and said solids, from the vapor and liquid contacting vessel mentioned in steps (a) and (b),

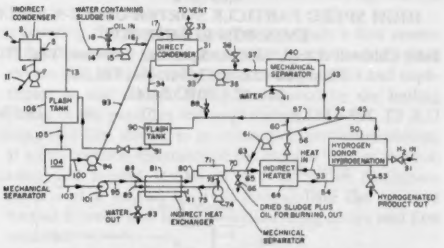
(d) pumping said first stream, mentioned in step (c), to a first mechanical separator.

(e) mechanically separating said first stream mentioned in step (d) into a stream consisting essentially of water and a second stream comprising water, water insoluble liquid and said solids, whereby said second stream is substantially reduced in water content relative to said first stream,

(f) feeding said second stream, mentioned in step (e), to a first flash tank and flashing said second stream to a first reduced pressure within said first flash tank, thereby to yield an overhead stream comprising steam and a third stream comprising water, water insoluble liquid and said solids, whereby said third stream is further substantially reduced in water content relative to said second stream,

(g) feeding said third stream, mentioned in step (f), to a second flash tank and flashing said third stream to a second reduced pressure, whereby said reduced pressure is lower than said first reduced pressure, mentioned in step (f), thereby to yield an overheated stream comprising steam and a fourth stream comprising water, water insoluble liquid and said solids, whereby said fourth stream is further substantially reduced in water content relative to said third stream,

(h) feeding said fourth stream, mentioned in step (g) to a second mechanical separator,



(i) mechanically separating said fourth stream, mentioned in step (h), into a stream comprising said water insoluble liquid and a fifth stream comprising said solids and said water insoluble liquid, whereby the water insoluble liquid content of said fifth stream is substantially reduced relative to the water insoluble liquid content of said fourth stream,

(j) withdrawing at least a portion of said fifth stream, mentioned in step (i), as product. Passing at least another portion of said fifth stream to a heat exchange zone wherein this last mentioned portion of the first stream is first heated and then mixed with the second stream, which was mentioned as produced in step (e), before the second stream passes to the first flash tank as mentioned in step (f),

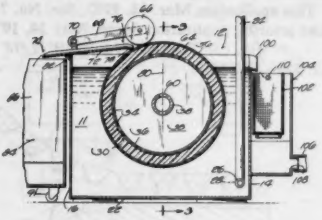
(k) recycling said water insoluble liquid stream mentioned in step (i) to a point in said process downstream of said first mechanical separator, as mentioned in step (d), as upstream of said first flash tank, said water insoluble liquid stream being at least part of the water insoluble liquid stream mentioned in step (a),

(l) And hydrogenating solids, while contained, in a portion of the fifth liquid stream, with the formation of a hydrogenated water insoluble fraction being formed which is at least partially recycled to the process as the water insoluble liquid previously mentioned.

4,097,379
SELF-CLEANING FILTER ASSEMBLY

Richard J. Shelstad, 2131 N. Summit, Milwaukee, Wis. 53212

Filed Oct. 25, 1977, Ser. No. 844,592
Int. Cl.[2] B01D *33/06*
U.S. Cl. 210—167 15 Claims



1. A self-cleaning filter assembly comprising

a collecting tank for receiving a quantity of a liquid containing suspended substances

a hollow drum rotatably mounted in said collecting tank for movement through liquid contained in said collecting tank and including a plurality of perforations in the outer periphery thereof;

a pliable filter material disposed about the outer periphery of said drum for filtering suspended substances from the liquid passing therethrough, the filtered liquid subsequently passing through said drum perforations into the interior of said drum;

a layer of porous, resilient material, capable of absorbing a portion of the filtered liquid passing through said filter material, interposed said filter material and the outer periphery of said drum;

means for rotating said drum;

squeezing means adapted to bear against the outer surface of said filter material and compress said resilient material as said drum is rotated so that a portion of the filtered liquid retained in said resilient material is forced back through said filter material and serves as a back wash for dislodging filtered substances collected on said filter material,

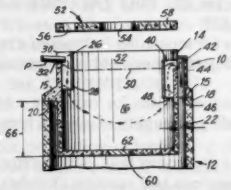
collecting means located adjacent said squeezing means for collecting the back wash liquid containing the dislodged substances; and

means for discharging the filtered liquid from the interior of said drum.

4,097,380
SEPTIC TANK-LEACHING POOL ARRANGEMENT

Karl Carlson, Kings Park, N.Y., assignor to Anthony J. Scotto, Smithtown, N.Y.

Filed Apr. 22, 1976, Ser. No. 679,514
Int. Cl.[2] B01D *43/00*
U.S. Cl. 210—170 7 Claims

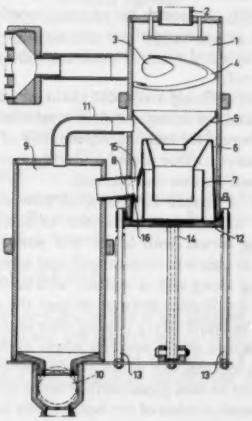


1. A septic tank for use with a leaching pool having an upper wall edge, said septic tank comprising: a cylindrical portion of precast concrete, said cylindrical portion defining therein a chamber for the storage and treatment of raw sewage and having an upper edge wherein are provided inlet and outlet openings in substantially diametrally opposed relation; a support ring on and positioned concentrically about said cylindrical portion for mounting said septic tank on the upper wall edge of the leaching pool and such that an annular space is formed between the septic tank and leaching pool; an inlet baffle supported on said cylindrical portion internally thereof at said inlet opening and having an open top end and an open bottom end and a vertical channel therethrough for the passage of raw sewage from said inlet opening into said chamber, said inlet baffle opening at said top end through said inlet opening for the receipt of raw sewage; an outlet baffle supported on said cylindrical portion internally thereof at said outlet opening and a vertical channel therethrough for directing treated liquid sewage from said chamber via said outlet opening to the leaching pool, said outlet baffle opening laterally through said outlet opening for the discharge of sewage from the septic tank to the leaching pool via said annular space and a cover on said cylindrical portion for obturating the said cylindrical portion, said cover having a pair of viewing openings formed therein in vertical alignment with said open top ends of said inlet baffle and said outlet baffle whereby inspection of the channels of the baffles may be carried out; said septic tank further comprising a plurality of positioning haunches spaced about the circumference of said cylindrical portion, each of said positioning haunches being generally triangular members connected to said cylindrical portion and to the bottom of said support ring, each of said positioning haunches having a width less than the width of said support ring, so that the support ring when positioned on the upper edge of the leaching pool is automatically centered thereon.

4,097,381
SEPARATOR WITH THROW-AWAY CONTAINER

Bo Ritzler, Sodertalje, Sweden, assignor to AB Filtrator, Sodertalje, Sweden

Filed Feb. 25, 1977, Ser. No. 772,105
Claims priority, application Sweden, Feb. 27, 1976, 7602722
Int. Cl.[2] B01D *21/26*
U.S. Cl. 210—259 4 Claims



1. A device for separating solid particles from a fluid carrying the particles comprising a substantially cylindrical separation chamber having an upper portion including a feed opening for receiving the fluid carrying the particles, an air evacuation opening for providing a vacuum to said separation chamber, and a lower portion having a drainage opening through which the fluid may be drained; a funnel-shaped member secured to the separation chamber disposed between the feed opening and the drainage opening; an exchangeable collecting vessel for collecting and retaining the particles, said collecting vessel having an inlet opening located below the funnel-shaped mem-

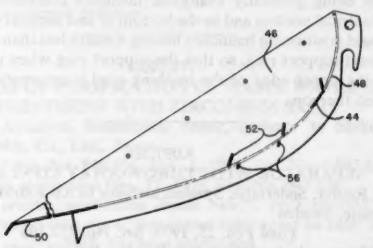
ber and an outlet having a self-closing resilient membrane thereacross; and means for piercing said resilient membrane and for sealably engaging it with the drainage opening.

4,097,382

DEWATERING SCREEN

Ronald DeWayne Cruea, Carlisle, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

Filed Mar. 28, 1977, Ser. No. 781,729
Int. Cl.[2] B01D *35/28*
U.S. Cl. 210—456 **11 Claims**



1. An apparatus for separating particles from a liquid slurry comprising:

screening means formed of a plurality of parallel spaced horizontally disposed bar-shaped members aligned to form the generatrices of a concave screening surface over which the liquid slurry flows from a top end to a bottom end thereof;

guide means defining a vertical guide surface abutting each side of said screening means for substantially the entire length thereof for maintaining the flow of liquid slurry on said concave surface of said screening means from said top end to said bottom end thereof;

a plurality of spaced ridge-shaped flow disruption means secured to each guide surface adjacent said abutting screening means with lower end portions of each said disruption means in contact with said screening means and extending along and in contact with each said guide surface for a sufficient distance to span the maximum thickness of the liquid slurry passing over said concave surface of said screen at the position where each said disruption means is secured, the width of said disruption means perpendicular to said guide surface being sufficient to divert a substantial portion of the liquid slurry that would otherwise flow on said concave surface of said screening means adjacent said guide surfaces into said central portion of the flow of slurry so that it will be subjected to the screening action of said screening means;

input means for delivering the liquid slurry to said top end of said concave surface of said screening means;

collecting means disposed along the back side of said screening means for capturing the portion of the liquid slurry which passes through said screening means; and

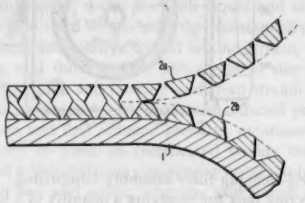
output means for receiving from said bottom end of said screening means the portion of the liquid slurry which does not pass through said screening means.

4,097,383

PROCESS FOR PRODUCTION OF MICROPOROUS SHEET

Sumio Ohtani; Nobuo Hiratsuka, and Masaru Horiguchi, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Continuation of Ser. No. 581,062, May 27, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,481
Claims priority, application Japan, May 24, 1974, 49-58472
Int. Cl.[2] B01D *39/14;* **B32B** *31/18*
U.S. Cl. 210—500 M **23 Claims**



1. A microporous membrane filter produced by the steps consisting of bonding a microporous sheet directly to a plate, said microporous sheet having larger pores at its interior than at either of its original surfaces and; splitting the sheet along a plane perpendicular to the thickness direction of the sheet by a peeling operation into two microporous membrane sheets, wherein one sheet is retained on said plate and the other sheet is peeled from the retained sheet and; removing the retained sheet from the plate, said filter being either the peeled microporous membrane sheet or the microporous membrane sheet removed from said plate, said filter having a pore size at its peeled surface larger than the pore size at its original surface.

9. A process for producing a microporous membrane filter which consists of

bonding a microporous sheet directly to a plate said sheet having larger pores at its interior than at either of its original surfaces; splitting the sheet along a plane perpendicular to the thickness direction of the sheet by a peeling operation into two microporous membrane sheets, wherein one sheet is retained on said plate and the other sheet is peeled from the retained sheet, said sheet peeled from the retained sheet having larger pores at the surface formed by peeling than at the opposite original surface and being suitable for use as a microporous membrane filter.

4,097,384

PROCESS FOR URANIUM ISOTOPE SEPARATION

John H. Coleman, Locust Valley, N.Y., and Tobin J. Marks, Evanston, Ill., assignors to Northwestern University, Evanston, Ill. and Plasma Physics Corporation, Locust Valley, N.Y.

Filed Mar. 22, 1976, Ser. No. 668,829
Int. Cl.[2] B01J *1/10;* **B01K** *1/00*
U.S. Cl. 250—527 **11 Claims**

1. Apparatus for separating isotopes of a metallic element to provide an isotopically-enriched product, said apparatus comprising:

reaction chamber means for retaining a chemical composition including a plurality of isotopic species of the metallic element,

valve means for controlling introduction of the chemical composition into said reaction chamber means,

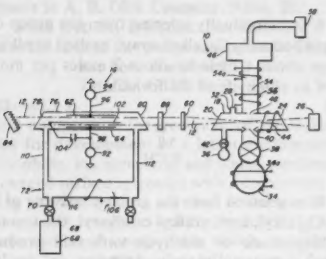
means for controlling atmospheric composition within said reaction chamber means,

temperature control means to regulate the temperature interiorly of said reaction chamber means,

generator menas including power supply means for producing a beam of radiated energy,

means including electrode means to direct said beam to

impinge upon said chemical composition contained in said chamber means to interact with and to modify properties



of said chemical composition so as to facilitate the separation of isotopic components thereof.

4,097,385

FIRE-PROOFING SEALING ELEMENTS

Wulf von Bonin, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 13, 1976, Ser. No. 648,850
Claims priority, application Germany, Jan. 30, 1975, 2503712
Int. Cl.[2] C09K *3/28*
U.S. Cl. 428—35 **3 Claims**

1. A fire-proofing sealing material comprising a flexible tube impermeable to water, resistant to aqueous alkali and enclosing an aqueous alkali metal silicate in the form of a solution or a gel.

4,097,386

LUBRICATING OIL ADDITIVE COMPOSITION

Warren Lowe, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 1, 1976, Ser. No. 673,063
Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*
U.S. Cl. 252—32.7 R **12 Claims**

1. An additive composition for use in crankcase lubricating oils comprising:

(1) an oil-soluble antioxidant selected from aromatic or alkyl sulfides and polysulfides, sulfurized olefins, sulfurized carboxylic acid esters, and sulfurized ester-olefins, and

(2) an oil-soluble tertiary amine of the formula $(R)_3N$, wherein each R is independently C_3-C_{10} alkyl.

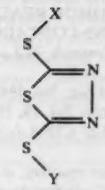
4,097,387

OLEFIN-DIMERCAPTO-THIADIAZOLE COMPOSITIONS AND PROCESS

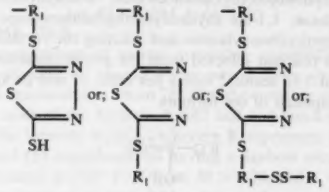
Gunter Caspari, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 3, 1976, Ser. No. 720,266
Int. Cl.[2] C10M *1/38, 3/32*
U.S. Cl. 252—47.5 **50 Claims**

1. A lubricating oil composition having anti-wear properties comprising a major proportion of lubricating oil and an effective amount of an oil soluble additive, said additive comprising the oil soluble reaction product of an olefin; lithium, sodium or potassium 2,5-dimercapto-1,3,4-thiadiazole or mixtures thereof; and a sulfur compound selected from the group consisting of S_2Cl_2, SCl_2, S_2Br_2, SBr_2, R—S—Cl, R—S—Br, and mixtures thereof, wherein R comprises C_1–C_{100} hydrocarbyl or bromo, chloro or hydroxy substituted hydrocarbyl and said additive comprises,



wherein X comprises $R_1 - SS - R_2$; R_1 comprises C_6–C_{100} hydrocarbyl or bromo, chloro or hydroxy substituted hydrocarbyl, and R_2 comprises R_1 or



and Y comprises H or X.

4,097,388

LINEAR FLUORINATED POLYETHER LUBRICANT COMPOSITIONS CONTAINING PERFLUOROALKYLETHER SUBSTITUTED PHOSPHINES

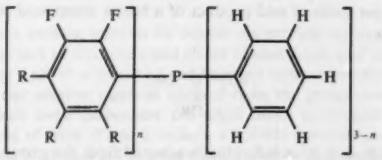
Carl E. Snyder, Jr., Trotwood, and Christ Tamborski, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 12, 1976, Ser. No. 731,483
The portion of the term of this patent subsequent to Mar. 8, 1993, has been disclaimed.
Int. Cl.[2] C10M *1/10*
U.S. Cl. 252—49.9 **9 Claims**

1. A lubricant composition comprising (1) a base fluid consisting essentially of a mixture of linear fluorinated polyethers having the following formula:

$$R_fO(CF_2CF_2O)_m(CF_2O)_nR_f$$

wherein R_f is CF_3 or C_2F_5, m and n are integers whose sum is between 2 and 200 and the ratio of n to m is between 0.1 and 10; and (2) a corrosion-inhibiting amount of a perfluoroalkylether substituted aryl phosphine having the following formula:



wherein one of the R's is a perfluoroalkylether group, two of the R's are fluorine, and n is 1, 2 or 3.

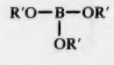
4,097,389

NOVEL AMINO ALCOHOL REACTION PRODUCTS AND COMPOSITIONS CONTAINING THE SAME

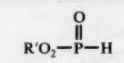
Harry J. Andress, Jr., Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 494,789, Aug. 5, 1974, abandoned. This application Jul. 19, 1976, Ser. No. 706,411
Int. Cl.[2] C10M *1/32*
U.S. Cl. 252—51.5 A 12 Claims

1. A product prepared by reacting, at a temperature of from about 100° to about 200° C., one mole of alkenylsuccinic acid, anhydride or acyl halide with from 0.05 to 5 moles of a hydroxylated primary amine selected from the group consisting of 1-amino-2-hydroxypropane, 1-amino-3-hydroxypropane, 1-amino-2,3-dihydroxypropane, 1-amino-2,3,4-trihydroxybutane, 1-(hydroxymethyl)aminoethane, tris(hydroxymethyl)-aminomethane, 1,1-bis (hydroxymethyl)aminoethane and 1-(hydroxymethyl)benzylamine and reacting the resulting product with a reactant selected from the group consisting of (1) from about 1 to about 2 moles per mole of said product of a boron compound of the formula



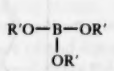
in which each R′ is individually selected from the group consisting of hydrogen and a C_1–C_{20} alkyl, aralkyl or aralkyl group, (2) from about 1 mole to about 2 moles per mole of said product of an organophosphonate of the formula



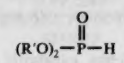
in which R′ is individually selected from the group consisting of hydrogen and a C_1–C_{20} alkyl, arayl, aralkyl or alkaryl group (3) or from about 1 mole to about 2 moles per mole of said product of an aldehyde of the formula

in which R′ is selected from the group consisting of hydrogen and a C_1–C_{20} alkyl, aryl, aralkyl or alkaryl, the reaction of the boron, phosphonate or aldehyde with said product taking place at from about 50° to about 250° C.

7. An organic fluid composition comprising a major proportion of a mineral lubricating oil, a synthetic lubricating oil, a grease prepared from these or a normally liquid hydrocarbon fuel and a detergent amount of a product prepared by reacting one mole of alkenylsuccinic acid, anhydride or acyl halide with from 0.05 to 5 moles of a hydroxylated primary amine selected from the group consisting of 1-amino-2-hydroxypropane, 1-amine-3-hydroxypropane, 1-amine-2,3-dihydroxypropane, 1-amino-2,3,4-trihydroxybutane, 1-(hydroxymethyl-)aminoethane, tris(hydroxymethyl)-aminomethane, 1,1-bis(hydroxymethyl)aminoethane and 1-(hydroxymethyl) benzylamine and reacting the resulting product with a reactant selected from the group consisting of (1) from about 1 to about 2 moles per mole of said product of a boron compound of the formula



in which each R′ is individually selected from the group consisting of hydrogen and a C_1–C_{20} alkyl, aralkyl or aralkyl group, (2) from about 1 mole to about 2 mole of said product of an organophosphonate of the formula



in which R′ is individually selected from the group consisting of hydrogen and a C_1–C_{20} alkyl, arayl, aralkyl or alkaryl group or (3) from about 1 mole to about 2 moles per mole of said product of an aldehyde of the formula

in which R′ is selected from the group consisting of hydrogen and a C_1–C_{20} alkyl, aryl, aralkyl or alkaryl, the reaction of the boron, phosphonate or aldehyde with said product taking place at from about 50° to about 250° C.

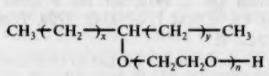
4,097,390

COMPOSITION FOR MINERAL CONCENTRATE DEWATERING DURING FILTRATION

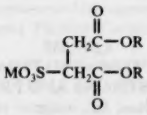
Samuel Shang-Ning Wang, Cheshire, and Morris Eugene Lewellyn, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 20, 1977, Ser. No. 817,408
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—60 10 Claims

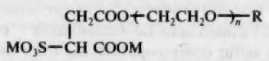
1. A dewatering aid for mineral concentrates comprising (1) from about 5 to about 98.9 weight percent of an ethoxylated secondary alcohol of the structure



wherein *n* is an integer of about 1 to 10 and *x* and *y* are integers such that their sum is equal to about 7 to 23; (2) from about 1 to about 94.9 weight percent of a dialkylsulfosuccinic acid or salt thereof of the structure



wherein R is an alkyl group of about 8 to 20 carbon atoms and M is a hydrogen, alkali metal or ammonium ion; and (3) from about 0.1 to about 10 weight percent of a mono(ethoxylated alcohol) carboxylate ester of a sulfosuccinic acid or salt thereof of the structure



wherein R is an alkyl group of about 8 to 26 carbon atoms, *n* is an integer of about 1 to 10 and M is a hydrogen, alkali metal or ammonium ion.

4,097,391
LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHIC OFFSET MASTERS

Elias P. Moschovis, and John L. Gilson, both of Morton Grove, Ill., assignors to A. B. Dick Company, Niles, Ill.

Filed Oct. 24, 1975, Ser. No. 625,773

The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.

Int. Cl.[2] G03G *9/12*

U.S. Cl. 252—62.1 L **8 Claims**

1. A liquid composition for treatment of the surface of an offset master for development of a latent electrostatic image which is oleophilic, ink receptive, and water repellent, and in which the imaged surface is treated with a conversion solution for rendering the non-imaged portions of the master surface ink repellent, water receptive and hydrophilic, the improvement wherein the liquid composition which, in addition to a water repellent, ink receptive, oleophilic toner, is formulated to contain an amine selected from the group consisting of morpholine, N-ethyl morpholine and N-methyl morpholine.

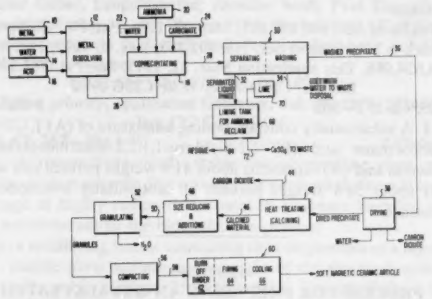
4,097,392
COPRECIPITATION METHODS AND MANUFACTURE OF SOFT FERRITE MATERIALS AND CORES

Alex Goldman, Pittsburgh, and Alfred M. Laing, Butler, both of Pa., assignors to Spang Industries, Inc., Butler, Pa.

Filed Mar. 25, 1975, Ser. No. 561,833

Int. Cl.[2] C01G *49/08*

U.S. Cl. 252—62.62 **30 Claims**



1. Wet process for producing a material, consisting essentially of metal carbonates and metal hydroxides, for conversion into pulverant ferrimagnetic material compactable into soft ferrite components consisting essentially of ferric oxide and at least one divalent metal oxide, comprising the steps of

(a) producing a precipitate and a liquid phase by

(i) forming an aqueous metal ion solution of ferrous ions and divalent ions of at least one other metal in which the divalent metal ions of said at least one other metal are selected from the group consisting of Mn^{++} Zn^{++}, Ni^{++}, and Mg^{++};

(ii) providing a solution containing carbonate ions and hydroxide ions in which the source of carbonate ions is selected from the group consisting of ammonium bicarbonate, ammonium carbonate, sodium carbonate, and potassium carbonates,

(iii) reacting said metal ion solution with said solution containing carbonate ions and hydroxide ions to coprecipitate ferrous carbonate and said other divalent metal ions as metal carbonates and to concurrently coprecipitate ferrous hydroxide and said other divalent metal ions as metal hydroxides, essentially without converting ferrous ions to ferric ions;

(iiii) controlling such coprecipitation to select a desired ratio between carbonate groups and hydroxide groups in the coprecipitated material, with the carbonate groups being at a level to facilitate separation of coprecipitated particles from the liquid phase and the hydroxide groups being at a level to maintain sufficient residual hydroxide groups to extend solid-state reactivity of coprecipitated particles for grain growth and densification purposes until a final heat treatment of a pressure compacted component;

(b) separating said coprecipitated material from the liquid phase, and

(c) drying said separated coprecipitated material.

4,097,393
SILICONE-HYDROCARBON COMPOSITIONS

Robert Alton Cupper, Ridgefield, Conn., and Richard Welty Shiffler, Briarcliff Manor, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,386

Int. Cl.[2] C10M *3/44, 1/50*

U.S. Cl. 252—78.3 **5 Claims**

1. A composition of matter consisting essentially of (A) dimethyl siloxane oil having a viscosity of from about 10 to about 100 centistokes at about 25° C and consisting essentially of siloxy units of the formula R_2SiO and end-blocking siloxy units of the formula $R_3SiO_{0.5}$ wherein R represents a methyl radical, and (B) naphthenic oil having a Saybolt seconds universal viscosity at 100° F of from 30 to 500, and a viscosity-gravity constant of at least 0.84; wherein the proportions of components of (A) to (B) ranges from about 70:99 percent by volume of (A) to about 30:1 percent by volume of (B), and wherein said proportions of (A) and (B) are selected such that said components (A) and (B) remain miscible with each other at about −40° F for at least 72 hours.

5. A process for transmitting force from the brake pedal means of a vehicle through hydraulic line means connected to master brake cylinder means and to activated means comprising substantially filling said hydraulic means, said master brake cylinder means and said activated means with a composition of matter as defined in claim 1.

4,097,394
ETCHING LIQUID FOR ETCHING ALUMINUM

Gijsbertus Gerlach, and John Joseph Kelly, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 607,557, Aug. 25, 1975, abandoned. This application May 2, 1977, Ser. No. 792,641

Claims priority, application Netherlands, Sep. 3, 1974, 7411645

Int. Cl.[2] C09K *13/02*; C23F *00/00*

U.S. Cl. 252—79.5 **6 Claims**

1. An etching solution for selectively etching layers at least 100 μ thick of aluminum and alloys of aluminum, said solution having a pH of at least 11.5 and being an aqueous solution of at least one alkaline material selected from the group consisting of alkali metal carbonates and alkali metal hydroxides in an amount of from 0.1 to 2 mole/l, a soluble ferricyanide in an amount of from 5 g/l to saturation, the molar ratio of hydroxide to ferricyanide being at most equal to 1 and a soluble salt of a phosphorus acid derived from trivalent or pentavalent phosphorous oxide selected from the group consisting of ortho-

phosphates, metaphosphates, polyphosphates, pyrophosphates and phosphites in an amount sufficient to reduce undercutting.

4,097,395

MOLD AND MILDEW REMOVAL COMPOSITION AND METHOD OF MANUFACTURE

Dan E. Posey, and Benjamin Mosier, both of Houston, Tex., assignors to Chempro Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 720,986, Sep. 7, 1976, abandoned, which is a continuation of Ser. No. 388,660, Aug. 15, 1973, abandoned. This application Jan. 17, 1977, Ser. No. 759,747

Int. Cl.[2] C11D *3/065, 3/48*

U.S. Cl. 252—106 **12 Claims**

1. A concentrate which when added to water and an oxidizing agent produces a reactive mixture capable of killing and removing mold and mildew consisting essentially of the following constituents:

Constituent	Range in % by weight
Water	93.30 - 87.65
Sodium metasilicate	0.60 - 0.90
Sodium tripolyphosphate	2.50 - 3.50
Sodium alkyl benzene sulfonate detergent	0.10 - .80
Polyethoxylated nonyl phenol	0 - 0.15
Sodium-o-phenylphenolate	0.50 - 1.50
Acetic acid (glacial)	2.00 - 5.50

4,097,396

SOAPS AND DETERGENTS CONTAINING ALPHA-OXY(OXO)SULFIDES AS PERFUMES

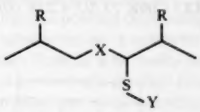
William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, both of N.J.; Edward J. Shuster, Brooklyn, N.Y., and Frederick Louis Schmitt, Holmdel, N.J., assignors to International Flavors & Fragrances, Inc., New York, N.Y.

Division of Ser. No. 723,534, Sep. 15, 1976, Pat. No. 4,065,408. This application Jul. 28, 1977, Ser. No. 819,986

Int. Cl.[2] C11D *3/50, 9/44*

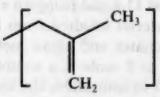
U.S. Cl. 252—132 **5 Claims**

1. A perfumed article comprising at least one compound having the structure:



wherein R is one of hydrogen or methyl and X is a ketone group having the structure:

and Y is selected from the group consisting of methyl, methallyl having the structure:



1-propyl, 2-methyl-1-propyl and acetyl, and a soap or detergent.

4,097,397

DRY CLEANING DETERGENT COMPOSITION

Hiroshi Mizutani, Yachiyo; Masaru Tamura, Sakura, and Katsumi Saegusa, Funabashi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1977, Ser. No. 809,524

Claims priority, application Japan, Oct. 27, 1976, 51-128966

Int. Cl.[2] C11D *3/26, 7/32*

U.S. Cl. 252—153 **11 Claims**

1. A dry cleaning detergent composition consisting essentially of (A) from 10 to 30 percent by weight of an alkanolamine salt of a linear alkylbenzenesulfonic acid having 10 to 14 carbon atoms in the alkyl group and wherein said alkanolamine is a monoalkanolamine, dialkanolamine or trialkanolamine having 2 or 3 carbon atoms in the alkanol group, (B) from 30 to 50 percent by weight of a dialkyl ester of sulfosuccinic acid having 8 or 9 carbon atoms in the alkyl group, (C) from 2 to 20 percent by weight of an adduct of 1 to 7 moles of an alkylene oxide having 2 or 3 carbon atoms to a higher fatty acid alkanolamide prepared from a fatty acid having from 10 to 18 carbon atoms and a monoalkanolamine or dialkanolamine having 2 or 3 carbon atoms in the alkanol group, and (D) the balance is essentially an organic dry cleaning solvent.

4,097,398

CONSTANT BOILING ADMIXTURES

William Milton Hutchinson, deceased, late of Bartlesville, Okla., and by Florence M. Hutchinson, executrix, Claremore, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 690,807, May 27, 1976, Pat. No. 4,039,465, which is a division of Ser. No. 602,353, Aug. 6, 1975, Pat. No. 4,024,086. This application Mar. 31, 1977, Ser. No. 783,243

Int. Cl.[2] C11D *7/50, 7/30;* **C23G** *5/02*

U.S. Cl. 252—162 **3 Claims**

1. A substantially constant boiling admixture of (A) 1,1,2-trifluoroethane and (B) 1,2-dichloro-1,1,2,2-tetrafluoroethane wherein said (A) represents about 41.6 weight percent and said (B) about 58.4 weight percent at substantially atmospheric pressure.

4,097,399

PROCESS FOR PREPARING AN OXYALKYLATED PRODUCT

Arthur L. Austin, Southgate; William W. Levis, Jr., Wyandotte; Louis C. Pizzini, Trenton, and Robert J. Hartman, Southgate, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 425,524, Dec. 17, 1973, Pat. No. 3,957,922. This application Jun. 25, 1975, Ser. No. 590,332

Int. Cl.[2] C07F *9/145;* **C08G** *71/04*

U.S. Cl. 252—182 **6 Claims**

1. Process for preparing an oxyalkylated product which comprises

1. providing a mixture containing
   a. a phenol, at least in an amount sufficient to form a complex with an aluminum or iron substance in the mixture,
   b. a non-phenolic active hydrogen compound having 2 to 8 active hydrogens per molecule and having an average molecular weight below about 10,000,
   c. a substance containing aluminum or iron which will form a complex with phenol, and
   d. an organic acid anhydride, at least one of which components (a), (b), and (d) is halogenated,
2. heating the mixture to a temperature in the range of from about 80° C. to about 250° C., and
3. oxyalkylating the heated mixture by adding thereto sufficient alkylene oxide having from 2 to 12 carbon atoms to form an oxyalkylated polyol product.

4,097,400

FLAMEPROOF POLYURETHANES

Joachim Wortmann, Turnich; Franz-Josef Dany, and Joachim Kandler, both of Erftstadt Lechenich, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 527,444, Nov. 26, 1974, abandoned. This application Apr. 9, 1976, Ser. No. 675,533
Claims priority, application Germany, Nov. 30, 1973, 2359700
Int. Cl.[2] C08K 5/51; C08G 18/14
U.S. Cl. 252—182 2 Claims

1. A homogenized mixture for the production of flameproof polyurethanes or polyurethane foams by reacting the said mixture with polyisocyanates, the said mixture containing a polyhydroxyl compound of high molecular weight, water, a catalyst, surfactants and ammoniumpolyphosphate as flameproofing substance, the ammonium polyphosphate having the general formula:

$$H_{(n-m)+2}(NH_4)_mP_nO_{3n+1}$$

in which n stands for a whole number averaging a numerical value of between about 600 to about 800, and the ratio of m : n being approximately 1 : 1.

4,097,401

THERMODYNAMICALLY STABLE PRODUCT FOR PERMANENT STORAGE AND DISPOSAL OF HIGHLY RADIOACTIVE LIQUID WASTES

Walter Guber, Leopoldshafen; Jaroslav Saidl; Paul Daruschy, both of Karlsruhe, and Werner Hild, Hochstetten, all of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Oct. 30, 1975, Ser. No. 627,310
Claims priority, application Germany, Jul. 30, 1975, 2534014
Int. Cl.[2] G21F 9/34
U.S. Cl. 252—301.1 W 7 Claims

1. A thermodynamically stable microcrystalline glass ceramic or glass ceramic-like product for permanent disposal and storage of highly radioactive wastes in a manner harmless to the environment or the biocycle, comprising:

(a) a solidifying matrix containing the components of a borosilicate glass including, by weight of the thermodynamically stable product, 35 to 50% SiO_2, 3 to 6% TiO_2, 5 to 10% Al_2O_3, 3 to 6% B_2O_3, 0 to 5% Na_2O;

(b) a plurality of nucleation agents, including, by weight, 3 to 6% MgO, 8 to 10% Li_2O and 3 to 6% K_2O; and

(c) 20 to 30% by weight of waste fission and corrosion products; said thermodynamically stable product is producible by a process with a highest process temperature used of 1200° C or less.

4,097,402

NUCLEAR FUEL ASSEMBLY AND PROCESS

Willard T. Grubb, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 29, 1976, Ser. No. 700,736
Int. Cl.[2] G21C 3/42
U.S. Cl. 252—301.1 R 16 Claims

1. For use in a nuclear reactor, an oxide composition nuclear fuel material in compacted pellet form containing at least one fissionable isotope and an amount of a metallic material selected from the group consisting of gold, silver and palladium and mixtures thereof effective to immobilize substantially all cadmium resulting from nuclear fission chain reactions of the nuclear fuel material through a reaction between the said cadmium and the said metallic material and thereby prevent cadmium embrittlement of nuclear fuel cladding at reactor operation temperatures.

4,097,403

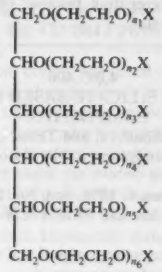
OIL-IN-WATER EMULSION AND EMULSIFYING OR SOLUBILIZING AGENT COMPOSITION USEFUL THEREIN

Hisao Tsutsumi, Sakura; Shizuo Hayashi, Sugitomachi; Hirokazu Nakayama, and Toshinao Ukena, both of Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1977, Ser. No. 760,962
Claims priority, application Japan, Feb. 5, 1976, 51-11525
Int. Cl.[2] B01J 13/00
U.S. Cl. 252—312 10 Claims

1. An emulsifying or solubilizing composition, consisting essentially of

I. from 58 to 95 percent by weight of a surface active agent having the formula



wherein the sum of n_1 to n_6 is from 10 to 100 and, on the average, from 3 to 6 of the X's are branched saturated acyl groups having from 11 to 21 carbon atoms and the balance of the X's are hydrogen,

II. from 0.5 to 2.5 percent by weight of an alkali metal salt of a linear or branched fatty acid having from 11 to 21 carbon atoms,

III. from 2.5 to 6.0 percent by weight of a linear or branched fatty acid having 11 to 23 carbon atoms, and

IV. from 2 to 35 percent by weight of a branched saturated fatty acid ester of polyethylene glycol having an average molecular weight of 150 to 2000, wherein the branched saturated fatty acid ester moiety has from 11 to 21 carbon atoms.

7. An oil-in-water emulsion containing as an emulsifier for the oil phase, an effective emulsifying amount of a composition as claimed in claim 1.

4,097,404

PROCESS FOR PROVIDING ENCAPSULATED TONER COMPOSITION

Robert Warren Brown, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 29, 1973, Ser. No. 327,528
Int. Cl.[2] B01J 13/02
U.S. Cl. 252—316 8 Claims

1. A method of providing encapsulated toner materials comprising dissolving a polymer in a monomer other than the monomer of said polymer which polymer is incompatible with the polymer of the monomer employed to form a solution said polymer being referred to as polymer A; dispensing said solution in a continuous phase; polymerizing the monomer so that polymer A forms a solvent-rich phase which forms the wall of the encapsulated toner material and the resulting polymer being referred to as polymer B forms a solvent-poor phase which becomes the core of the encapsulated toner material, said polymer A, the monomer and polymer B having a very limited solubility in the continuous liquid phase employed for polymerization.

4,097,405
PARTICULATE THICKENING AGENT

Ronald E. Watts, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 8, 1976, Ser. No. 703,363

Claims priority, application United Kingdom, Jul. 14, 1975, 29490/75

Int. Cl.[2] B01J *13/00;* **C08K** *3/36*

U.S. Cl. 252—316 **10 Claims**

1. A thickener comprising particulate matter of less than 425 microns, said particulate matter comprising silica particles of from 7×10^{-3} to 6 μ bonded to an acrylic polymeric material comprising on a dry basis, from 14 to 40% by weight of said particulate matter and capable of hydrogen bonding and being sufficiently hydrophilic to be dispersible in water or other aqueous liquids, said silica having a large surface area and being capable of aggregating because of hydrogen bonding when dispersed in water.

4,097,406
GLYCOL AND SILICATE-BASED SURFACTANT COMPOSITION

Robert N. Scott, Wallingford, and Thomas A. Knowles, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 8, 1976, Ser. No. 647,355

Int. Cl.[2] B01F *17/54*

U.S. Cl. 252—351 **28 Claims**

1. A process for preparing a glycol and silicate-based surfactant composition which comprises:

(a) preparing a silicate-based component by:

(i) reacting together, at a temperature of about 40° to 200° C,

(1) a silicon tetrahalide selected from the group consisting of silicon tetrachloride, silicon tetrabromide, and silicon tetraiodide, and, per every mole of said silicon tetrahalide (2) about 0.2 to 2.0 moles of water and (3) at least about one mole of an alcohol represented by the formula R_1OH wherein R_1 is alkyl of 2 to 20 carbon atoms or aryl of 6 to 14 carbon atoms, the reaction yielding a product made up of a volatile portion and a non-volatile portion, and

(ii) at a temperature of about 65° to 320° C and in the presence of a transesterification catalyst, reacting the non-volatile portion of the product of step (i) with a polyether alcohol having a molecular weight of about 500 to 5,000 and represented by the formula $R_2(C_nH_{2n}O)H$ wherein R_2 is alkyl of 1 to 10 carbon atoms and the moiety $(C_nH_{2n}O)$ represents a polyoxyalkylene chain consisting of from about 10 to 100% by weight of oxyethylene units, and, correspondingly, about 90 to 0% of oxypropylene units, oxybutylene units or a mixture of oxypropylene and oxybutylene units, said polyether alcohol being employed in a molar proportion ranging from about 0.006 to about 1.1 moles per every mole of said silicon tetrahalide which is used in step (i), with the proviso that the molar proportion of said polyether alcohol is no more than about 55% of the molar proportion of alcohol consumed in the reaction of step (i); and

(b) combining the silicate-based component obtained with a glycol component having the general formula:

$$R_3O\text{—}\left(CH_2\text{—}\underset{R_4}{\underset{|}{CH}}\text{—}O\right)_a\left(CH_2\text{—}CH_2\text{—}O\right)_b\text{—}_mH$$

wherein R_3 is hydrogen or an alkyl having about 1 to about 10 carbon atoms, R_4 is an alkyl having about 1 to about 4 carbon atoms, $a = 0$ to 1, $b = 0$ to 1, with the proviso that the sum of $a + b$ is greater than zero, and $m = 1$ to 17, said components being combined so as to produce a surfactant composition containing about 3 to about 60% by weight of glycol component, based on the total weight.

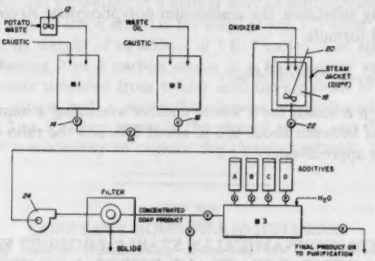
4,097,407
CLEANING COMPOSITION DERIVED FROM POTATO PROCESSING WASTES

Esthmel W. Ady, Richland, Wash., assignor to Larry Dale Ady, Kennewick, Wash.

Filed Apr. 4, 1975, Ser. No. 565,241

Int. Cl.[2] C11D *13/00, 9/38*

U.S. Cl. 252—370 **14 Claims**



1. A process for preparing a soap concentrate from potato processing wastes comprising the steps of:

(a) mixing pulverized starch-containing potato processing wastes with an alkali selected from the group consisting of sodium and potassium hydroxide in the presence of water to form a liquid potato digest;

(b) reacting a fatty acid source selected from the group consisting of animal fats and vegetable oils with an alkali selected from the group consisting of sodium and potassium hydroxide at a temperature in the range 135° – 150° F. to form a liquid soap;

(c) admixing said liquid soap and potato digest in a weight ratio of from 80:20 to 40:60 on a dry solids basis;

(d) heating said admixture in the presence of oxygen at a temperature in the range 180° – 212° F. for from 30 to 60 minutes to form a concentrated biodegradable cleaning composition;

(e) additionally heating the concentrated cleaning composition to about 150° F.;

(f) adding from one-half to one pound of dry caustic selected from the group consisting of sodium and potassium hydroxide for each ten pounds of concentrated cleaning composition;

(g) diluting the mixture resulting in (f) with water;

(h) boiling the resulting aqueous mixture; and,

(i) permitting the boiled mixture to cool and to separate into a solid soap portion and a liquid cleaner portion.

4,097,408
DIPEROXYESTER MIXTURE PREPARED BY REACTING DIHYDROPEROXIDES AND CARBONYLS

Jose Sanchez, Grand Island, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

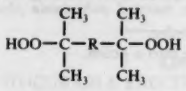
Filed Jan. 6, 1977, Ser. No. 757,179

Int. Cl.[2] B01J *31/02;* **C08F** *4/38*

U.S. Cl. 252—426 **30 Claims**

1. A method of preparing a diperoxyester mixture composition which comprises:

A. reacting 100 mole % of a dihydroperoxide having the structure:



wherein R is selected from the group consisting of an alkylene diradical of 2 to 4 carbons, an alkynylene diradical of 2 carbons, an alkadiynylene diradical of 4 carbons, 1,3 phenylene diradical and 1,4 phenylene diradical,

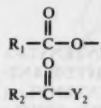
in the presence of 190 to 300 mole percent of a base with 180 to 220 total mole percent of at least two peroxyester forming carbonyl compounds selected from the group consisting of:

a)

wherein

i. R_1 is selected from a primary alkyl, alkyloxy, aryl, aryloxy, primary alkenyl, alkenyloxy, or cycloalkoxy, and

ii. Y_1 is selected from chloride, bromide or

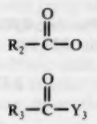


b)

wherein

i. R_2 is selected from a primary aralkyl, cycloalkyl, cycloalkenyl or secondary alkyl, and

ii. Y_2 is selected from chloride, bromide or

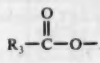


c)

wherein

i. R_3 is selected from a tertiary alkyl, secondary and tertiary aralkyl, or tertiary cycloalkyl, l-alkoxy-l-alkyl, l-aryloxy-l-alkyl, a-aloxy-tertiary alkyl or a-aryloxy-tertiary alkyl, and

ii. Y_3 is selected from chloride, bromide or



4,097,409

PREPARATION OF TITANIUM CONTAINING CATALYST ON MAGNESIUM SUPPORT MATERIAL

John Gabriel Speakman, Bo'ness, Scotland, assignor to The British Petroleum Company Limited, London, England

Filed Dec. 1, 1976, Ser. No. 746,494

Claims priority, application United Kingdom, Dec. 4, 1975, 49813/75

Int. Cl.[2] **C08F** *4/02, 4/10*

U.S. Cl. 252—429 R **9 Claims**

1. A process for the production of a supported Ziegler catalyst comprising treating: (a) a magnesium-containing support material obtained by heating at a temperature in the range of about 150°–1000° C a magnesium halide or a magnesium alkoxide with an inorganic oxide having surface hydroxyl groups, said inorganic oxide being silica or a silica composite containing at least 50% by weight of silica with (b) a halogen containing titanium compound of the formula $Ti(OR)_nX_{4-n}$ wherein n is 0, 1, 2, or 3, X is halogen and R is an alkyl group containing 1-6 carbon atoms at a temperature below 40° C, said catalyst having a magnesium concentration of from about 0.5 to 20% by weight based on the weight of the silica and magnesium compound together and a titanium concentration in the range of from about 0.01 to 20 wt. % based on the total weight of the catalyst.

4,097,410

HYDROCARBON CONVERSION CATALYST CONTAINING A CO OXIDATION PROMOTER

Elroy M. Gladrow, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Jun. 23, 1976, Ser. No. 698,902

Int. Cl.[2] **B01J** *29/06*

U.S. Cl. 252—455 Z **11 Claims**

1. A hydrocarbon conversion catalyst which comprises particles of crystalline aluminosilicate zeolite containing rare earth metal and particles of an ultra-stable Y zeolite containing a CO oxidation promoter, which particles are dispersed in a porous oxide matrix to produce a catalyst containing 0.8 to 4.5 wt. % of a rare earth metal (as oxides) and 2 to 100 ppm of a CO oxidation promoter comprising a metal or a compound of a metal selected from Periods 5 and 6 of Group VIII of the Periodic Table, rhenium, chromium, manganese and combinations thereof.

4,097,411

CATALYST FOR PREPARATION OF ORTHO-ALKYLATED PHENOLS

Bernardus J. van Sorge, Selkirk, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 846,967, Aug. 1, 1969, abandoned. This application Jan. 22, 1976, Ser. No. 651,251

Int. Cl.[2] **B01J** *29/00, 21/10*

U.S. Cl. 252—457 **9 Claims**

1. A molded to shape catalyst comprising a mixture of a magnesium oxide bonded with a minor amount of silica, the catalyst having a surface area of at least 20 sq. meters per gram.

2. The catalyst of claim 1 where the silica comprises from 1 to 15% by weight of the catalyst.

4,097,412

CATALYST CARRIERS AND A PROCESS FOR THEIR PREPARATION

Alain Muller, Le Havre, France, assignor to Compagnie Francaise de Raffinage, Paris, France

Filed Dec. 7, 1976, Ser. No. 748,302

Claims priority, application France, Dec. 8, 1975, 75 37506

Int. Cl.[2] **B01J** *21/04, 23/28, 23/30, 23/74*

U.S. Cl. 252—465 **54 Claims**

1. Process of preparation of a catalyst carrier precursor comprising the following principal steps:

(a) hydrolysis of a solution of an organic aluminum salt in a first organic solvent by mixture with an aqueous solution of at least one water-soluble salt of at least one second metal selected from the group consisting of nickel, tungsten, molybdenum, and cobalt, producing a coprecipitated gel;

(b) drying of the gel obtained between 70° and 140° C;

(c) said gel, after drying, is steeped in a second organic solvent and then kneaded.

4,097,413
DESULFURIZATION PROCESS AND CATALYST

Howard D. Simpson, Irvine, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 17, 1976, Ser. No. 751,383
Int. Cl.[2] B01J *21/04, 23/88*
U.S. Cl. 252—465 4 Claims

1. A method for the manufacture of a hydrodesulfurization catalyst which comprises:

(1) comulling boehmite alumina with sufficient of an aqueous ammonium molybdate solution to provide about 18–30 weight-percent of MoO_3 in the finished catalyst;

(2) drying the composite from step (1) at temperatures below about 500° F to a water content of between about 20 and 40 weight-percent;

(3) intimately admixing the dried composite from step (2) with sufficient of a water-soluble cobalt salt to provide about 4–12 weight-percent of CoO in the finished catalyst, and with sufficient water to provide an extrudable paste;

(4) extruding the paste into extrudates having a diameter between about 1/20 and ¼ inch; and

(5) calcining the extrudates at a temperature which is (a) between about 900° and 1250° F and (b) correlated with the MoO_3 content of said catalyst so as to give a final surface area of at least $m/0.14$ m^2/g, where M is the weight-percent of MoO_3 in said catalyst.

4,097,414
MODIFIED ETHYLENE OXIDE CATALYST AND A PROCESS FOR ITS PREPARATION

Stanley B. Cavitt, Austin, Tex., assignor to Texaco Development Corp., New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 719,042
Int. Cl.[2] B01J *23/04, 23/50*
U.S. Cl. 252—476 31 Claims

1. A cesium-modified, activated silver catalyst for the vapor phase epoxidation of ethylene with an oxygen-containing epoxidizing agent prepared by:

contacting a porous, inorganic, catalyst support material with an impregnating solution; and,

heating the impregnated support material at temperatures from about 50° C to 300° C to evaporate volatiles and activate said catalyst,

wherein said impregnating solution comprises an effective amount of a cesium salt in solution with a silver carboxylate amine complex of a silver carboxylate dissolved in a solubilizing amount of an amine-containing complexing agent selected from the group consisting of

(a) aliphatic diamines selected from the group consisting of N-alkyl substituted piperazines and C-alkyl substituted piperazines;

(b) aliphatic polyamines containing at least three amino moieties wherein at least one is primary or secondary; and

(c) aliphatic amino ethers containing at least one ether linkage and at least one amino moiety which is primary or secondary.

4,097,415
PRODUCTION OF IMPROVED ANODES FOR SOLID ELECTROLYTE CAPACITORS

Jean-Claude Moulin; Balint Escher, and Dominique Prince, all of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

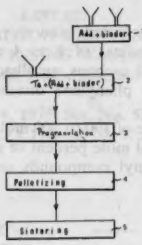
Filed Mar. 9, 1976, Ser. No. 665,287
Claims priority, application France, Mar. 3, 1975, 75 09029; Jun. 6, 1975, 75 17382
Int. Cl.[2] H01B *1/02*
U.S. Cl. 252—512 10 Claims

1. A method for producing anodes of film forming metal for dry electrolytic capacitors which comprises:

providing a quantity of powdered film forming metal to constitute an anode,

mixing said powder with a binder,

pressing the resulting mixture into a pellet,



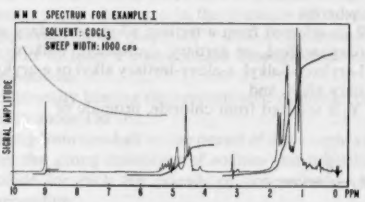
introducing within said pellet an additive comprising a compound of an element selected from the group consisting of W, Mo, V and Hf with a non-metal element selected from the group consisting of O, S, Se and Te, and

sintering the resulting pellet.

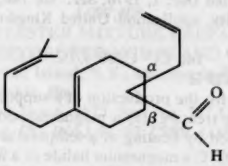
4,097,416
1-(2-PROPENYL)-3-(4-METHYL-3-PENTENYL)-Δ^3-CYCLOHEXENE-1-CARBOXALDEHYDE AND 1-(2-PROPENYL)-4-(4-METHYL-3-PENTENYL)-Δ^3-CYCLOHEXENE-1-CARBOXALDEHYDE, PERFUME COMPOSITIONS

John B. Hall, Rumson; Mark A. Sprecker, Sea Bright; Manfred Hugo Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin Vinals, Red Bank, and Robert M. Novak, Fords, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 741,088, Nov. 11, 1976, Pat. No. 4,068,012.
This application Aug. 24, 1977, Ser. No. 827,298
Int. Cl.[2] C11B *9/00*
U.S. Cl. 252—522 2 Claims



1. A perfume composition comprising a mixture of the compounds 1-(2-propenyl)-3-(4-methyl-3-pentenyl)-Δ^3-cyclohexene-1-carboxaldehyde and 1-(2-propenyl)-4-(4-methyl-3-pentenyl)-Δ^3-cyclohexene-1-carboxaldehyde defined by the structure:



wherein the carboxaldehyde moiety is bonded either at the alpha-carbon atom or the beta-carbon atom of the cyclohexenyl moiety and at least one adjuvant selected from the group

consisting of natural perfume oils, synthetic perfume oils, alcohols, aldehydes, ketones, nitriles, esters and lactones.

4,097,417

PHOTOCURABLE ELECTROCONDUCTIVE COATING COMPOSITION

Stephen D. Pastor, Edison; Martin M. Skoultchi, Somerset, and Henry R. Hernandez, Somerville, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed May 2, 1974, Ser. No. 466,264

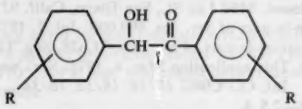
Int. Cl.[2] H01L *13/00;* **C08F** *8/00, 2/46*

U.S. Cl. 252—501 **11 Claims**

1. An actinic radiation cross-linkable coating composition of matter consisting essentially of:

(A) an acrylic monomer devoid of groups which inhibit free radical polymerization, having at least one terminal acrylate or substituted acrylate group,

(B) a photoactivatable freee radical polymerization initiator selected from the group consisting of 3-hydroxy-2-butanone, phenanthrene-quinone, polyhalogenated aromatic anhydrides, (C_1–C_4) benzoin ethers and benzoins of the formula:



where R is a member of the group consisting of hydrogen, halogen and C_1–C_{20} alkyl, said initiator being present as a separate species or in a chemical combination with said monomer, and

(C) a copolymerizable monomer which is an organic compound having at least one terminal ethylenically unsaturated group and selected from the group consisting of salts of allyl substituted quaternary ammonium compounds and alkali metal salts of acrylic, methacrylic and vinylbenzene sulfonic acids,

wherein at least one of said monomers in part A or part C contains more than one terminal ethylenically unsaturated group.

4,097,418

GRANULAR COLORED SPECKLES

Thomas Richard Rolfes, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 619,756, Oct. 6, 1975, abandoned, and a continuation-in-part of Ser. No. 598,523, Jul. 23, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 758,361

Int. Cl.[2] C11D *3/065, 3/40, 11/00, 17/06*

U.S. Cl. 252—531 **2 Claims**

1. The method of making a low- or non-staining colored speckle which comprises agglomerating from 60 to about 85%, by weight of the granular colored speckle, of a granular, water-soluble, hydratable inorganic alkaline salt selected from the group consisting of sodium tripolyphosphate, sodium pyrophosphate, sodium orthophosphate, and mixtures thereof, with from about 15 to about 35% by weight of the granular colored speckle, of an aqueous anionic surfactant paste comprising from about 20 to about 50%, by weight, of an anionic surfactant selected from the group consisting of sodium alkylbenzene sulfonates having 10 to 14 carbons in the alkyl chain, sodium coconut alkyl sulfate, sodium tallow alkyl sulfate, the sodium salt of the sulfated condensation product of C_{10} to C_{18} alcohols having an average of 3 moles of ethylene oxide per mole of alcohol, and mixtures thereof, and having admixed in said paste from about 0.5 to about 10%, by weight of the granular colored speckle, of a coloring agent selected from the group consisting of phthalocyanine blue, phthalocyanine green, ultramarine blue, Polar Brilliant Blue, Rhodamine BM, Pontacyl Light Yellow 36 and mixtures thereof.

2. A granular colored speckle in agglomerate form made by the process of claim 1.

4,097,419

PROCESS FOR STABILIZED HIGH STRENGTH UREA-ALDEHYDE POLYMERS

William Percy Moore, Jr., Hopewell, Va., assignor to Waverly Chemical Co., Hopewell, Va.

Filed Sep. 26, 1977, Ser. No. 836,492

Int. Cl.[2] C08J *9/30, 9/12*

U.S. Cl. 260—2.5 F **4 Claims**

1. An improved process for producing stable urea-aldehyde insulating foams having properties of improved structural strength and low formaldehyde vapor emission, from two separate storable liquids, said process comprising: blending an air-foamed solution containing dialdehydes having two to eight molecular carbons, surfactant, and mineral acid, with a partially cured aqueous urea-formaldehyde resin containing between 1.3 and 1.5 mols of formaldehyde per mol of urea and about 50 percent total solids, so that the molecular aldehyde moieties supplied by the dialdehyde are between 0.2 and 0.4 times the number of aldehyde moieties supplied by formaldehyde, and the molecular ratio of total aldehyde moieties to urea is between 1.7 and 2.0; curing and drying the blended fluids at a pH between 2.0 and 3.5 at ambient conditions until the foam hardens.

4,097,420

METHOD FOR PREPARATION OF MACROPOROUS AMPHOTERIC ION EXCHANGERS WITH HIGHLY CROSSLINKED HYDROPHILIC POLYMERIC MATRIX

Otakar Mikeš; Petr Štrop, and Jiří Coupek, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Feb. 7, 1975, Ser. No. 548,095

Claims priority, application Czechoslovakia, Feb. 12, 1974, 978/74

Int. Cl.[2] C08F *2/18;* **B01D** *15/08*

U.S. Cl. 260—2.1 R **6 Claims**

1. A method for preparation of hydrophilic macroporous ion exchangers of amphoteric character for isolation and separation of biological materials, comprising the steps of polymerizing a mixture of (a) anionogenous monomers, selected from a group of compounds comprising sulfoalkyl methacrylates, sulfoalkyl acrylates, sulfoalkylacrylamides and sulfoalkylmethacrylamides, (b) cationogenous monomers, selected from a group of compounds comprising aminoalkyl acrylates, aminoalkyl methacrylates, aminoalkylacrylamides and aminoalkylmethacrylamides and their quaternary ammonium compounds, and (c) at least 10 mol % of crosslinking monomers of acrylate or methacrylate type, selected from group of compounds comprising alkylene diacrylates, alkylene dimethacrylates, oligoglycol and polyglycol diacrylates and dimethacrylates, bisacrylamides, bismethacrylamides and divinylbenzene, in the presence of inert organic compounds, selected from a group of alcohols, organic acids, amines and nitriles, in an aqueous dispersion phase.

4,097,421

FOAMABLE STRUCTURAL THERMOPLASTIC POLYESTER RESINS

Tai Ming Chang, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 8, 1974, Ser. No. 458,747

Int. Cl.[2] C08J *9/00*

U.S. Cl. 260—2.5 N **15 Claims**

1. Foamable thermoplastic polyester moldable compositions having reduced melt viscosity compared with the original polyester resin comprising

(a) thermoplastic polyester resin homopolyesters selected from the group consisting of poly(ethylene terephthalate) and poly(tetramethylene terephthalate), copolyesters and

physical blends of homopolyesters and copolyesters of ethylene terephthalate and of tetramethylene terephthalate having crystalline melting points above about 300° F.,

(b) 0.05 to 15 parts by weight based on the weight of polyester resin of a melt viscosity reducing agent selected from the group consisting of esters of organic acids containing from 10 to 27 carbon atoms and alkali or alkaline earth metal salts of an organic acid having from 10 to 25 carbon atoms,

(c) 0.05 to 15 parts by weight based on the weight of the polyester resin of a hydrocarbyltetrazole which can be decomposed to release a gas harmless to the polyester, and

(d) 2 to 45 parts by weight of a reinforcing agent selected from the group consisting of glass fibers, potassium titanate fibers, aramid fibers, asbestos fibers and graphite fibers based on the combined weight of the polyester resin and the reinforcing agent.

4,097,422

INORGANIC-ORGANIC COMPOSITIONS

Peter Markusch, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 13, 1974, Ser. No. 469,253

Claims priority, application Germany, May 17, 1973, 2325090

Int. Cl.[2] C08G *18/12, 18/77;* **C08K** *3/36*

U.S. Cl. 260—2.5 AK **28 Claims**

1. A porous inorganic-organic composition obtained by reacting a mixture comprising:

(A) from 5–98% by weight of an organic polyisocyanate selected from the group consisting of

(i) organic polyisocyanates which contain ionic groups or groups capable of forming ionic groups in the presence of alkali, and

(ii) non-ionic-hydrophilic polyisocyanates prepared by reacting an excess of an organic polyisocyanate with an organic hydrophilic compound containing at least one group which is reactive with isocyanate groups,

(B) from 2–95% by weight of an aqueous silica sol containing about 20–60% by weight of said silica, and

(C) from 0–93% by weight of an inorganic water-binding component, said water-binding component being capable of absorbing water to form a solid or gel, all of said percents by weight of components (A), (B) and (C) being based on the total weight of components (A), (B) and (C), said composition being a solid/solid xerosol.

4,097,423

INORGANIC-ORGANIC COMPOSITIONS

Dieter Dieterich, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 446,558, Feb. 27, 1974, which is a continuation-in-part of Ser. No. 364,763, May 29, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,476

Claims priority, application Germany, Jun. 3, 1972, 2227147; Mar. 2, 1973, 2310559; Nov. 30, 1973, 2359610; Nov. 30, 1973, 2359616; Jun. 14, 1974, 2435950

Int. Cl.[2] C08G *18/32;* **C08K** *3/34, 3/36, 3/40*

U.S. Cl. 260—2.5 AK **35 Claims**

1. An inorganic-organic composition obtained by reacting a mixture of

(A) from 5–98% by weight of an organic polyisocyanate,

(B) from 2–95% by weight of an aqueous alkali metal silicate solution containing about 20–70% by weight of said alkali metal silicate, and

(C) from 0–93% by weight of a water-binding component, said component being capable of absorbing water to form a solid or a gel,

wherein said percents by weight of (A), (B) and (C) are based on the total weight of (A), (B) and (C), with the proviso that when (C) is 0–20% by weight, component (A) contains 2–200 milliequivalent of ionic groups or groups capable of forming salt groups in the presence of alkali metal silicates per 100 grams of said organic polyisocyanate, and wherein said composition is a solid/solid xerosol.

6. The composition of claim **1** wherein an inert liquid boiling at temperatures from −25° to +50° C is included in the reaction mixture as a blowing agent in a quantity of up to 50% by weight and the reaction mixture is allowed to react to completion while foaming.

13. The composition of claim **1** wherein said composition is based on:

(A) 10–80% by weight of said organic polyisocyanate,

(B) 20–80% by weight of said aqueous alkali metal silicate solution, and

(C) 10–70% by weight of said water-binding component.

14. The composition of claim **13**, wherein the reaction mixture contains a foam stabilizer.

4,097,424

PROCESS FOR THE PRODUCTION OF POLY(URETHANE SILICATE) RESIN AND FOAMS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 599,000, Jul. 7, 1975, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Mar. 4, 1976, Ser. No. 663,924

Int. Cl.[2] C08G *18/14, 18/32, 18/38*

U.S. Cl. 260—2.5 A **14 Claims**

1. The process for the production of poly(urethane silicate) compositions which comprises the steps of:

(a) providing about 1 mol of silicic acid gel which has been air dried at 25° to 75° C; mols of silicic acid are calculated on the basis of the amount by weight of silicon dioxide in the silicic acid gel;

(b) mixing therewith from about 0.5 to about 2 mols of an organic diisocyanate selected from the group consisting of toluene-2,4-diisocyanate; toluene-2,6-diisocyanate; diphenylmethane-4,4'-diisocyanate; naphthalene-1,5-diisocyanate; hexamethylene diisocyanate; 3,3'-dimethyldiphenylmethane-4,4'-diisocyanate; meta-phenylene diisocyanate; triphenylmethane triisocyanate; dianisidine diisocyanate; xenylenediisocyanate; dichloroxenylene diisocyanate; naphthalene-1,5-diisocyanate; fluorene diisocyanate; and mixtures thereof;

(c) maintaining said mixture at a temperature of from about 20° to about 60° C; and

(d) agitating said mixture until a smooth creamy appearance is obtained.

2. The process according to claim **1** including the further steps of adding water and a catalyst to said mixture and heating said mixture to a temperature of from about 90° to about 150° C until said mixture expands in volume at least 3 times, forming a self-sustaining foam.

4,097,425

THERMOPLASTIC FORMABLE BLENDS, A FOAMING METHOD AND PRODUCTS MADE THEREBY

George E. Niznik, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 608,451, Aug. 28, 1975, abandoned. This application Mar. 22, 1976, Ser. No. 669,028

Int. Cl.[2] C08J *9/08, 9/10*

U.S. Cl. 260—2.5 N **32 Claims**

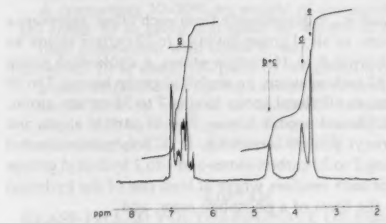
1. A substantially uniform injection moldable foamable blend comprising thermoplastic organic polymer and from 0.1% to 25% by weight of 5-phenyl-3,6-dihydro-1,3,4-oxadiazin-2-one.

4,097,426

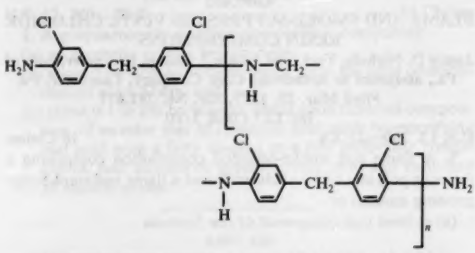
CURING AGENTS FOR POLYURETHANE FOAMS AND ELASTOMERS AND PROCESS OF USE

Wataro Koike; Masami Takayama, both of Shizuoka; Hideaki Ohashi, Fujieda, and Sadayoshi Matsui, Shimizu, all of Japan, assignors to Ihara Chemical Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1976, Ser. No. 735,101
Claims priority, application Japan, Sep. 29, 1976, 51-117038
Int. Cl.[2] C08G *18/14, 18/32;* C09K *3/00*
U.S. Cl. 260—2.5 AM 13 Claims



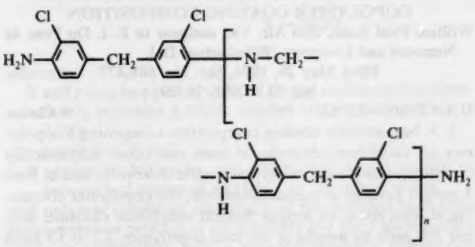
1. A curing agent for polyurethane which comprises a mixture which is solid at room temperature and has a melting point of at most 110° C of at least two compounds represented by the general formula:



wherein *n* stands for zero or a positive integer and is greater than zero in at least one of said compounds,

the compounds having been prepared by subjecting to dehydrocondensation 4, 4′-methylene-bis (2-chloroaniline) and formaldehyde in a molar ratio sufficient to produce a solid mixture of reaction products.

8. A process for the production of polyurethane which comprises reacting a mixture of a polyol and a polyisocyanate or a polyurethane prepolymer having terminal isocyanate groups with a curing agent in the presence of a blowing agent, characterized by using as said curing agent a mixture which is solid at room temperature and has a melting point of at most 110° C of at least two compounds represented by the general formula:



wherein *n* stands for zero or a positive integer and is greater than zero in at least one of said compounds,

said compounds having been prepared by subjecting to dehydrocondensation 4, 4′-methylene-bis (2-chloroaniline) and formaldehyde in a mol ratio sufficient to produce a solid mixture of reaction products.

4,097,427

CATIONIZATION OF STARCH UTILIZING ALKALI METAL HYDROXIDE, CATIONIC WATER-SOLUBLE POLYMER AND OXIDANT FOR IMPROVED WET END STRENGTH

Thomas Aitken, Chicago, Ill., and Wilfred D. Pote, Appleton, Wis., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 14, 1977, Ser. No. 768,114
Int. Cl.[2] C08L *3/02*
U.S. Cl. 260—9 8 Claims

1. An improved method for the cationization of starch which comprises cooking starch at a temperature and for a period of time to cause gelation and under alkaline conditions with a water soluble quaternary ammonium polymer in the presence of an oxidizing agent from the group consisting of ammonium persulfate, potassium persulfate, hydrogen peroxide, sodium hypochlorite, ozone, and t-butyl hydroperoxide.

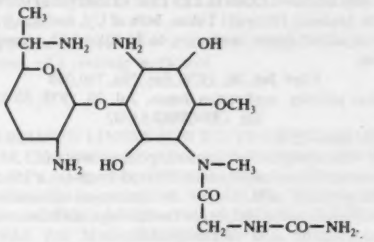
4,097,428

FORTIMICIN C AND PROCESS FOR PRODUCTION THEREOF

Takashi Nara, Tokyo; Ryo Okachi; Mitsuyoshi Yamamoto, both of Machida; Yasuki Mori, Kawasaki; Moriyuki Sato, Machida; Masahiro Sugimoto, and Yoshiaki Shimizu, both of Shizuoka, all of Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 708,681, Jul. 26, 1976, Pat. No. 4,048,015.
This application May 26, 1977, Ser. No. 800,925
Claims priority, application Japan, Aug. 1, 1975, 50-93182
Int. Cl.[2] C07D *309/22*
U.S. Cl. 260—345.9 R 2 Claims

1. Fortimicin C, a composition of matter having an antibacterial activity, having the following structural formula:



4,097,429

THERMOPLASTICALLY PROCESSIBLE MOULDING COMPOUND OF CELLULOSE ESTERS AND ETHYLENE/VINYL ESTERS COPOLYMERS

Salah Elabd Elghani, Zarga, Jordan; Winfried Fischer, Cologne, and Richard Prinz, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 581,706, May 28, 1975, abandoned. This application May 24, 1976, Ser. No. 689,685
Claims priority, application Germany, May 29, 1974, 2426178
Int. Cl.[2] C08L *1/14*
U.S. Cl. 260—17 R 12 Claims

1. An injection molded or extruded article of

(1) 1 to 99 percent by weight of at least one cellulose ester of a C_1–C_5-aliphatic carboxylic acid, the relative viscosity thereof being between 2.5 and 6.0,

(2) 99 to 1 percent by weight of an incompatible ethylene/vinyl ester copolymer containing 30 to 75 percent by weight

of vinyl esters of C_1–C_{18}-aliphatic or C_7–C_{11}-aromatic carboxylic acids and

(3) 0–50 percent by weight of a compatible ethylene/vinyl ester copolymer containing 75.1 to 98 percent by weight of vinylesters of C_1–C_{18}-aliphatic or C_7–C_{11}-aromatic carboxylic acids, the sum of components (1) to (3) being 100 percent by weight.

4,097,430

AQUEOUS POLYMERIC DISPERSIONS MADE THIXOTROPIC BY CERTAIN AMMONIUM OR POTASSIUM ZIRCONIUM CARBONATES

Raymond Francis Phillips, Cincinnati, Ohio, assignor to Magnesium Elektron Ltd., Swinton, England

Continuation of Ser. No. 500,735, Aug. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 297,415, Oct. 12, 1972, abandoned. This application Aug. 12, 1976, Ser. No. 713,637

Claims priority, application United Kingdom, Oct. 22, 1971, 49144/71

Int. Cl.[2] **C08L** *1/28*

U.S. Cl. 260—17 R **13 Claims**

1. A method of making a thixotropic aqueous dispersion of a polymer or copolymer selected from the group consisting of alkyd resins and products obtained by polymerisation of at least one of vinyl esters, acrylic esters, methacrylic esters, styrene, acrylonitrile, ethylene and vinylidine chloride which comprises mixing with a dispersion of said polymer or copolymer

(1) an amount sufficient of an aqueous solution of ammonium zirconium carbonate to impart thixotropic properties to said dispersion, said solution containing 18-25% by weight of zirconium expressed as zirconium dioxide and having a molar ratio of carbonate to zirconium not greater than 2.05; and

(2) a water-soluble organic colloid containing an hydroxyl group.

4,097,431

AROMATIC COPOLYESTER COMPOSITION

Nakaba Asahara; Hiroyuki Takao, both of Uji, and Kenji Yasue, Kyoto, all of Japan, assignors to Unitika Ltd., Amagasaki, Japan

Filed Jul. 30, 1976, Ser. No. 710,050

Claims priority, application Japan, Jul. 30, 1975, 50-93300

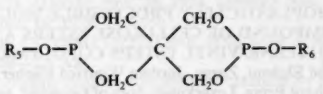
Int. Cl.[2] **C08G** *63/02*

U.S. Cl. 260—22 R **29 Claims**

1. A resin composition consisting essentially of:

(A) an aromatic copolyester derived from (a) a mixture of terephthalic acid and/or its functional derivative and isophthalic acid and/or its functional derivative, with the terephthalic acid unit/isophthalic acid unit mole ratio being about 9:1 to about 1:9, and (b) 2,2-bis(4-hydroxyphenyl)propane, or its functional derivative, and

(B) a phosphite compound of the general formula



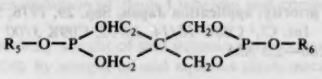
wherein R_5 and R_6, independently from each other, represent a hydrogen atom, an alkyl group having 1 to 22 carbon atoms, an aryl group having 6 to 16 carbon atoms, a cycloalkyl group having 6 to 12 carbon atoms, an arylalkyl group having 7 to 38 carbon atoms, an alkylaryl group having 7 to 38 carbon atoms a polyhydric phenol residue having 7 to 38 carbon atoms and 1 to 2 hydroxyl groups remaining, or a polyhydric alcohol residue having 2 to 22 carbon atoms and 1 to 2 hydroxyl groups remaining, or such residues where at least one of the hydroxyl groups is in the form of a phosphite ester.

9. A resin composition consisting essentially of

(A) an aromatic copolyester derived from (a) a mixture of terephthalic acid and/or its functional derivative and isophthalic acid and/or its functional derivative, with the terephthalic acid unit/isophthalic acid unit mole ratio being about 9:1 to about 1:9, and (b) 2,2-bis(4-hydroxyphenyl)propane,

or its functional derivative,

(B) a phosphite compound of the general formula



wherein R_5 and R_6, independently from each other, represent a hydrogen atom, an alkyl group having 1 to 22 carbon atoms, an aryl group having 6 to 16 carbon atoms, a cycloalkyl group having 6 to 12 carbon atoms, an arylalkyl group having 7 to 38 carbon atoms, an alkylaryl group having 7 to 38 carbon atoms, a polyhydric phenol residue having 7 to 38 carbon atoms and 1 to 2 hydroxyl groups remaining, or a polyhydric alcohol residue having 2 to 22 carbon atoms and 1 to 2 hydroxyl groups remaining, or such residues where at least one of the hydroxyl groups is in the form of a phosphite ester, and

(C) a salt formed between an organic carboxylic acid containing 2 to 22 carbon atoms and a metal of Groups I, II, III and IV of the Periodic Table.

4,097,432

FLAME AND SMOKE-SUPPRESSED VINYL CHLORIDE RESIN COMPOSITIONS

James D. Nichols, York, and Edwin J. Quinn, Lancaster, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

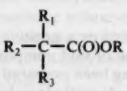
Filed Mar. 28, 1977, Ser. No. 781,677

Int. Cl.[2] **C08K** *5/10*

U.S. Cl. 260—23 XA **18 Claims**

1. A flame and smoke-retarded composition comprising a resinous polymer of vinyl chloride and a flame and smoke-suppressing amount of

(a) at least one compound of the formula



wherein R is C_1 to C_{18} linear or branched alkyl and R_1, R_2, and R_3 are the same or different and are hydrogen, C_1 to C_8 linear or branched alkyl or halogen; and

(b) an oxide, hydroxide or salt of iron (III), zinc or mixtures thereof.

4,097,433

HEAT-SEALABLE VINYLIDENE CHLORIDE COPOLYMER COATING COMPOSITION

William Paul Kane, Bon Air, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 20, 1976, Ser. No. 688,477

Int. Cl.[2] **C08L** *91/00*

U.S. Cl. 260—23 AR **9 Claims**

1. A heat-sealable coating composition comprising a copolymer of vinylidene chloride, at least one other ethylenically unsaturated monomer copolymerizable therewith, and at least 5 weight percent of methacrylonitrile, the copolymer containing at least about 88 weight percent vinylidene chloride, and, per 100 parts by weight of the total copolymer, 2.7 to 3.3 parts by weight of behenic acid, 0.4 to 0.6 part by weight of carnauba wax, 1.2 to 1.8 parts by weight of candelilla wax, 0.5 to 1.0 part by weight of stearamide, and 2.7 to 3.3 parts by weight of glyceryl monostearate.

4,097,434

ADHESIVE COMPOSITION

George T. Coker, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 673,517, Apr. 5, 1976, abandoned. This application Sep. 1, 1976, Ser. No. 719,494
Int. Cl.[2] C08L *93/00*
U.S. Cl. 260—23.3 4 Claims

1. An adhesive composition comprising:
(a) 100 parts by weight of a block copolymer having at least two monoalkenyl arene polymer end blocks A and at least one elastomeric conjugated diene mid block B, said blocks A comprising 10–30% by weight of the copolymer;
(b) about 50 to about 200 parts by weight of a tackifying resin compatible with block B; and
(c) about 10 to about 100 parts by weight of a rubber compound oil plasticizer having a saturates content of less than about 15% by weight, an aromatics content of above about 55% by weight, a specific gravity of 0.9 to 1.1 and a viscosity at 212° F of 80 to 1,000 SSU.

4,097,435

GLASS-FILLED POLYCARBONATE OF IMPROVED DUCTILITY

Herbert L. Rawlings, and Arthur L. Baron, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Apr. 11, 1977, Ser. No. 786,308
Int. Cl.[2] C08K *7/14, 5/10*
U.S. Cl. 260—28 R 11 Claims

1. A polycarbonate molding composition comprising
(a) an aromatic polycarbonate resin,
(b) about 5 to 40% by weight, based upon the total composition, of glass fibers, and
(c) about 0.1 to 2% by weight, based upon the total composition, of an ester wax of montanic acid made by esterifying said acid with a fatty alcohol or a low molecular weight glycol, said alcohol or glycol having upto and including 26 carbon atoms.

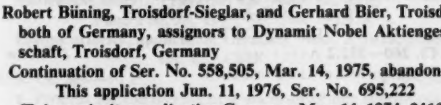
4,097,436

HYDROLYZED VINYL ACETATE-VINYL ALKOXY SILANE POLYMERS

Robert Büning, Troisdorf-Sieglar, and Gerhard Bier, Troisdorf, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation of Ser. No. 558,505, Mar. 14, 1975, abandoned. This application Jun. 11, 1976, Ser. No. 695,222
Claims priority, application Germany, Mar. 14, 1974, 2412292
Int. Cl.[2] C08F *216/06;* C08L *29/04*
U.S. Cl. 260—29.6 H 5 Claims

1. A water soluble copolymer having recurring units of the formula



wherein
X and *y* may be equal or unequal to one another and independently represent a whole number of 1 or more and up to 2,000;
n equals 0 to 2; and
R represents hydrogen, aryl, cycloalkyl or a branched or unbranched saturated alkyl of 1 to 18 carbon atoms,
said polymer consisting essentially of the acidified saponified polymerization product of vinyl acetate and vinyl alkoxy silane alone or additionally with a monoethylenically unsaturated copolymer which is polymerizable with vinyl acetate, said polymer containing 0.1 to 20 weight percent vinyl alkoxy silane units based on the total weight of monomers, the vinyl acetate component being present in an amount of 1 to 2,000 units, the vinyl silane component being present in an amount of 1 to 2,000 units, the unacidified and unsaponified copolymer having a relative viscosity determined in a 1 weight percent solution in ethyl acetate at 20° C of 1.05 to 6, said polymer when dissolved in water and applied as an acidified solution to a substrate and dried forming a partially or fully water-insoluble sheet.

4,097,437

THIXOTROPIC AQUEOUS COATING COMPOSITION OF SOLUBILIZED POLYMER WITH DISPERSION OF QUATERNARY AMMONIUM CLAY IN ALIPHATIC HYDROCARBON

Bhimashanker Gopal Dhake, Livonia, Mich., assignor to M & T Chemicals Inc., Stamford, Conn.

Filed May 27, 1977, Ser. No. 801,224
Int. Cl.[2] C08J *3/08;* C08K *5/19, 9/04;* C09D *5/04*
U.S. Cl. 260—29.2 E 6 Claims

1. A thixotropic aqueous coating composition comprising
(1) from 15 to 25%, based on the weight of said composition, of a film-forming, solubilized polymer,
(2) from 0.5 to 5%, based on the weight of said composition, of finely divided silica,
(3) sufficient water to achieve a concentration of non-volatile materials of from 30 to 60%, based on the weight of said composition,
(4) from 0.5 to 5%, based on the weight of said composition, of a smectite type clay which has been modified by reaction with a quaternary ammonium salt of the general formula $R_2{}^1R_2{}^2N^{\oplus}X^{\ominus}$ wherein R^1 is alkyl and contains from 1 to 4 carbon atoms, R^2 is alkyl and contains from 12 to 20 carbon atoms and X is chlorine or bromine, said smectite clay being present as a dispersion in a water-immiscible liquid aliphatic hydrocarbon that constitutes from 1 to 10% of the total weight of said aqueous coating composition and boils within the range from 100° to 200° C.
(5) from 0.1 to 1%, based on the weight of said composition, of a monohydric alcohol of a molecular weight from 32 to 118, and
(6) from 0.5 to 5%, based on the total weight of said composition, of a cationic surfactant.

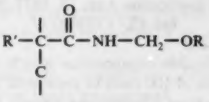
4,097,438

WATER-BASED LINERS FOR BEVERAGE CONTAINERS

Roger M. Christenson, Gibsonia, and Rudolf Maska, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 470,480, May 16, 1974, abandoned. This application Aug. 5, 1974, Ser. No. 494,688
Int. Cl.[2] C08L *33/02*
U.S. Cl. 260—29.4 UA 5 Claims

1. A water-based coating composition for use as an internal sanitary liner for metal containers adapted for packing beverages, said composition especially adapted for spray application and consisting essentially of:
(A) from about 5 percent to about 60 percent by weight of an amine partially-neutralized interpolymer formed in the presence of a vinyl polymerization catalyst and in the absence of mercaptan, said interpolymer being comprised of:
(1) from about 5 percent to about 25 percent of acrylamide or methacrylamide in units of the structure



wherein R′ is methyl or hydrogen and R is hydrogen or

butyl with at least 50 percent of the groups represented by R being butyl;

(2) from about 3 percent to about 25 percent of units formed from acrylic acid;

(3) from about 5 percent to about 75 percent of hardening monomer units derived from styrene; and

(4) from about 5 percent to about 75 percent of flexibilizing monomer units derived from ethyl acrylate;

wherein the acid groups of said interpolymer are partially neutralized with a sufficient amount of monomeric amine to solubilize the interpolymer but with an amount of amine which does not produce more than 0.764 milliequivalents of salt per gram of resin solids; and

(B) from about 40 percent to about 95 percent by weight of a liquid medium consisting of a mixture of water soluble or water miscible organic solvents in water wherein at least 60 percent by weight of the mixture is water.

4,097,439

POLYURETHANE COATING COMPOSITION CURABLE BY ADDITION POLYMERIZATION

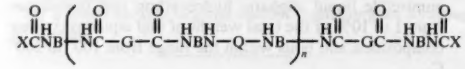
Thomas Robert Darling, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 8, 1977, Ser. No. 766,598

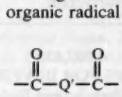
Int. Cl.[2] C08L *18/04*

U.S. Cl. 260—31.2 N **4 Claims**

1. A coating composition consisting essentially of (A) 5 to 70 percent by weight of the coating composition of at least one ethylenically unsaturated monomer capable of being polymerized by free radical polymerization, said monomer being at least a partial solvent for (B), and (B) 30 to 90 percent by weight of the coating composition of a polymer having a molecular weight of 2,000 to 20,000 and the formula



where G is a bivalent organic radical resulting from removal of terminal hydrogen groups from a diol, a diamine, or an aminoalcohol having a molecular weight of 300 to 3000, B is a bivalent organic radical having a molecular weight of about 80 to 400, Q is a bivalent organic radical having the formula



where Q' is formed by removing two active hydrogens from a primary or secondary diamine having a molecular weight between 60 and 300, X is a monovalent organic radical formed by removal of an active hydrogen from an alcohol or a monoamine having a molecular weight of not greater than about 300, and containing at least one polymerizable ethylenic linkage, and *n* is the integer 1, 2, 3 or 4, said coating composition having a viscosity between about 1 and 3000 poises.

4,097,440

RESIN COMPOSITION

Michael J. Maximovich, Akron, and Gary L. Burroway, Doylestown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 680,818, Apr. 28, 1976, Pat. No. 4,064,092, which is a continuation of Ser. No. 529,829, Nov. 4, 1974, abandoned. This application Aug. 23, 1977, Ser. No. 827,037

Int. Cl.[2] C08F *6/14*

U.S. Cl. 260—31.4 R **5 Claims**

1. A water reducible composition which comprises an admixture or solution of 100 parts of resin with about 50 to about 100 parts by weight of a coalescing solvent therefor comprising at least one solvent selected from ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, ethylene glycol monobutyl ether, diethylene glycol monobutyl ether, diethylene glycol monoethyl ether acetate, diethylene glycol diethyl ether, ethylene glycol monomethyl ether acetate, methyl ethylketone, acetone, methyl propyl ketone and diacetone alcohol and about 5 to about 70 parts by weight of at least one compatible plasticizer characterized by having a melting point of about −40° C. to about 25° C., a boiling point of at least 95° C. and a solubility parameter of about 8 to about 16; where said resin has a Ring and Ball softening point in the range of about 100° C. to about 300° C., and is prepared by the method which comprises free radical aqueous emulsion polymerizing, in an aqueous medium having a pH in the range of about 2 to about 7, or free radical organic solution polymerizing a monomer mixture which comprises, based on 100 weight percent of monomers

(1) about 70 to about 85 weight percent of at least one hard segment hydrophobic enhancing monomer selected from styrene, α-methyl styrene, acrylonitrile, vinyl toluene, methyl methacrylate, vinyl chloride and vinylidene chloride,

(2) about 15 to about 25 weight percent of at least one soft segment hydrophobic enhancing monomer selected from at least one acrylate selected from methyl acrylate, ethyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, laural acrylate, isodecyl methacrylate, butyl methacrylate, isobutyl methacrylate, at least one vinyl ether selected from ethyl, butyl, octyl, decyl and cetyl vinyl ether and/or at least one diene selected from 1,3-butadiene, isoprene and 2,3-dimethyl butadiene, provided that said dienes of monomer part (B) and said monomer part (A) vinyl chloride and vinylidene chloride are not mixed together and copolymerized, and

(C) about 3 to 10 weight percent of at least one hydrophilic enhancing organic acid selected from acrylic, methacrylic, fumaric, itaconic and maleic acid.

4,097,441

5,6-DIHYDRO-4-OXO-4H-THIENO[2,3-b]THIOPYRAN-5-CARBOXAMIDES

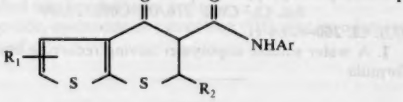
Jagadish C. Sircar, Dover; Stephen J. Kesten, Morris Plains, and Harold Zinnes, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 749,507, Dec. 10, 1976. This application Dec. 7, 1977, Ser. No. 858,233

Int. Cl.[2] C07D *495/04*

U.S. Cl. 260—332.2 A **2 Claims**

1. A compound of the Formula I:



I

wherein R_1 is hydrogen, halogen or lower alkyl; R_2 is hydrogen, lower alkyl or phenyl; and Ar is phenyl; or its pharmaceutically acceptable salts.

4,097,442

SANDABLE POLYURETHANE ADHESIVE COMPOSITION AND LAMINATES MADE THEREWITH

Alvin J. Kieft; Richard L. Cline, and Thomas G. Rabito, all of Ashland, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 21, 1977, Ser. No. 835,258

Int. Cl.[2] C08L *75/08*

U.S. Cl. 260—37 N **4 Claims**

1. A polyurethane adhesive that is sandable when cured, comprising a reaction mixture of

(a) about one mol of a reactive hydrogen containing polymeric material of 500 to about 3000 molecular weight

selected from the class of polyester polyols and polyether polyols of 2 to 4 hydroxyls;

(b) about 2.5 to 7 mols of an isocyanate composition comprised of a mixture of toluene diisocyanate and methane di(phenylisocyanate); and

(c) a filler composed of about 50 to 200 parts by weight of silica platelets and about 50 to 200 parts of glass spherical particles, a plasticizer amount of a polyvinyl chloride plasticizer, a polyurethane catalyst and sufficient monomeric nitrogen containing tetraol of 200 to 1000 molecular weight to provide 0.5 to 1.0 mol of curative for each mol of excess isocyanate.

4,097,443

METHOD FOR MANUFACTURING FOUNDRY MOLDS

Masayuki Nakamura, and Setsuo Sanuki, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Oct. 30, 1975, Ser. No. 627,413
Claims priority, application Japan, Nov. 1, 1974, 49-125508
Int. Cl.[2] C08K *3/36*
U.S. Cl. 260—38 **9 Claims**

1. A self-curing process for manufacturing foundry sand cores and molds which comprises preforming a mixture consisting essentially of the sand, resin consisting essentially of a phenol-formaldehyde resol resin and a volatile organic solvent for said resol resin selected from the group consisting of methanol, ethanol, propanol, acetone, methylethyl ketone, diacetone, ethyl acetate, butyl acetate, and mixtures thereof, the amount of resin being about 0.5 to 3 weight percent based on the weight of sand and the amount of solvent being about 0.2 to about 7 weight percent based on the weight of sand and evaporating the solvent from said preformed mixture at about 20° C. to about 50° C. to harden the resin and obtain the foundry mold composition.

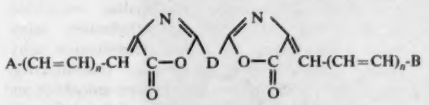
4,097,444

PROCESS FOR THE DYEING OF WATER-INSOLUBLE THERMOPLASTIC POLYMERS AND POLYCONDENSATES IN THE MASS

Wolfgang Teige, Kelkheim, Taunus, and Rudolf Schickfluss, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

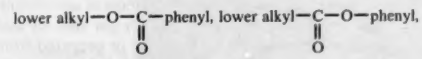
Filed Feb. 28, 1977, Ser. No. 772,573
Claims priority, application Germany, Mar. 2, 1976, 2608482
Int. Cl.[2] C08K *5/35*
U.S. Cl. 260—40 P **6 Claims**

1. Process for the dyeing of a water-insoluble thermoplastic polymer or polycondensate in mass, which comprises adding to the said thermoplastic material before the final molding thereof with an azlactone dyestuff of the formula (1)



(1),

in which A and B each represents phenyl, lower alkylphenyl, lower alkoxy-phenyl, chlorophenyl, nitrophenyl, cyanophenyl,



methylene-dioxy-phenylene or naphthyl, A and B being identical or different, E represents phenylene, lower alkyl-phenylene, di-lower alkoxy-phenylene, monochlorophenylene, dichlorophenylene, biphenylene or naphthylene, and *n* represents the integer 0 to 1, or with a mixture of dyestuffs of the said formula (1).

4,097,445

POLY(ESTER-AMIDE) HOT MELT ADHESIVES CONTAINING SPHEROIDAL METAL POWDERS

Joseph G. Martins, Ludlow, and Donald D. Donermeyer, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 2, 1976, Ser. No. 654,490
Int. Cl.[2] C08K *3/08*
U.S. Cl. 260—40 R **20 Claims**

1. An adhesive composition comprising:

a. from about 60 to about 30 parts by weight of a poly-(ester-amide) block copolymer melting in the range of about 155° to about 225° C. having from about 30 to about 70 percent by weight of crystalline polyester segments derived from at least one aliphatic or alicyclic diol having from 2 to 10 carbon atoms and at least one alicyclic or aromatic dicarboxylic acid having from 8 to 20 carbon atoms, and from about 70 to about 30 percent by weight of amorphous polyamide segments derived from an aliphatic polycarboxylic acid containing at least 40 weight percent of a C_{18} to C_{54} polycarboxylic acid and an aliphatic or alicyclic primary diamine containing 2 to 10 carbon atoms; and

b. from about 40 to about 60 parts by weight of finely divided spheroidal metal powder selected from the group consisting of aluminum, iron, mild steel, stainless steel and zinc of particle size in the range of about 0.2 to about 150 microns.

4,097,446

REINFORCED INTERCRYSTALLINE THERMOPLASTIC POLYESTER COMPOSITIONS

Visvaldis Abolins, Delmar, and Fred F. Holub, Schenectady, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 185,886, Oct. 1, 1971, Pat. No. 4,013,613. This application Aug. 25, 1976, Ser. No. 717,533
Int. Cl.[2] C08K *3/40*
U.S. Cl. 260—40 R **27 Claims**

1. A reinforced intercrystalline normally rigid thermoplastic molding composition, consisting essentially of in combination,

(a) at least one high molecular weight normally crystalline polyester resin which very rapidly crystallizes from the melt,

(b) at least one high molecular weight normally crystalline, normally amorphous or normally partially crystalline and partially amorphous polymer in the concentration range of from 1 to 99 parts by weight of (a) to 99 to 1 parts by weight of (b); that is selected from the group consisting of:
polyethylene,
poly(methylpentene),
a copolymer of ethylene and ethyl acrylate, poly(vinyl chloride),
a copolymer of vinyl chloride and vinyl acetate, natural rubber,
a rubbery copolymer of butadiene and acrylonitrile,
a polyamide,
a polyimide,
a polyorganosiloxane,
a copolymer of a polyorganosiloxane and a vinyl aromatic monomer, an acrylic monomer or an aromatic carbonate, and
a siloxane-nitrogen copolymer containing amido, amideimido or imide groups; and

(c) a reinforcing amount of a reinforcing filler for said combination.

4,097,447

HIGH TENSILE STRENGTH POLYETHYLENE/LOW-HYDRATION ALUMINA COMPOSITES

Edward George Howard, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 31, 1977, Ser. No. 783,453
Int. Cl.[2] C08K *3/10*
U.S. Cl. 260—42.14 **15 Claims**

1. A solid, particulate, polyethylene/low-hydration alumina composite which comprises

(a) 10–70% by weight of polyethylene having an inherent viscosity of at least 2, and

(b) 30–90% by weight of finely-divided, low-hydration alumina prepared by calcining alumina trihydrate having a weight-average equivalent spherical particle diameter of 0.1 to less than 50 μ at a temperature of at least 300° C for a time sufficient that the degree of hydration is reduced to not more than 0.8 H_2O, said low-hydration alumina having interacted at its surface a catalytically-effective amount of catalytically-active, transition metal compound, said polyethylene being polymerized onto the surface of said low-hydration alumina.

4,097,448

THERMOSETTABLE EPOXIDE-POLYANHYDRIDE COMPOSITIONS

William J. Heilman, Houston, Tex.; Frank C. Peterson, Joplin, Mo.; Mical C. Renz, and Leslie P. Theard, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Mar. 4, 1977, Ser. No. 774,379
Int. Cl.[2] C08K *7/14;* **C08L** *63/00*
U.S. Cl. 260—42.18 **19 Claims**

1. A method of forming a handleable, thermosettable composition which comprises

forming a homogeneous liquid resin mixture substantially free of active hydrogen comprising

(a) about five to about 80 weight percent based on the total resin components of an olefinically unsaturated monomer selected from styrene, ring-substituted chloro-, bromo or lower alkylstyrenes, lower alkylacrylates, lower alkylmethacrylates, vinyl acetate, acrylonitrile, vinyl chloride, vinyl bromide and vinylidene chloride, and mixtures thereof,

(b) an anhydride component consisting of

(1) an olefinically unsaturated monoanhydride selected from maleic anhydride, chloromaleic anhydride, methylmaleic anhydride, ethylmaleic anhydride, dichloromaleic anhydride, dimethylmaleic anhydride, n-butylmaleic anhydride, phenylmaleic anhydride, diphenylmaleic anhydride, chloromethylmaleic anhydride, bromophenylmaleic anhydride and itaconic anhydride, the molar ratio of the olefinically unaturated monomer (a) to the olefinically unsaturated monoanhydride being from about 0.5:1 to about 8:1;

(2) a saturated polyanhydride comprising the copolymer having between two and about 500 repeating units and prepared from one to 10 mols of said olefinically unsaturated monomer (a) per mol of said unsaturated monoanhydride (b) (1) or prepared from equimolar amounts of said unsaturated monoanhydride (b) (1) and one or more two to 20 carbon 1-alkenes or halogen-substituted 1-alkenes; and

(3) a saturated monoanhydride selected from phthalic anhydride, hexahydrophthalic anhydride, methyltetrahydrophthalic anhydride, dodecenylsuccinic anhydride, chlorendic anhydride, and a mixture of methyl bicyclo (2.2.1)heptane-2,3-dicarboxylic anhydride isomers;

(4) the ratio of the anhydride equivalents of said olefinically unsaturated monoanhydride (1) to the sum of the total anhydride equivalents in the resin solution being from about 0.2:1 to about 1:1 and the ratio of anhydride equivalents in said saturated polyanhydride (2) to the anhydride equivalents in said saturated monohydride (3) being at least about 1:1;

(c) an epoxy component substantially free of active hydrogen consisting of

(1) a saturated monoepoxy compound having between three and about 20 carbon atoms, and

(2) an epoxy resin having a 1,2-epoxy equivalent value greater than one which is soluble in the resin solution or is capable of forming a homogeneous dispersion in the resin solution,

(3) the ratio of epoxy equivalents in the monoepoxy compound to the epoxy equivalents in the epoxy resin being greater than 1:1 and an A/E ratio of total anhydride equivalents to total energy equivalents in the resin solution of about 0.1:1 to about 2.5:1; and

(d) from about 0.01 to about 10 weight percent of an anhydride accelerator which is substantially inactive during the copolymerization reaction of said olefinically unsaturated monomer (a) and said anhydride (b); and

copolymerizing said olefinically unsaturated monomer (a) with said anhydride component (b) by free radical means at a temperature up to about 150° C. without substantial reaction of the anhydride groups with the epoxide present in the resin mixture whereby a handleable, thermosettable composition comprising a homogeneous mixture of polyanhydride molecules, epoxide molecules and anhydride accelerator is obtained.

4,097,449

HANDLEABLE, THERMOSETTABLE EPOXIDE-POLYANHYDRIDE COMPOSITIONS

William J. Heilman, Houston, Tex.; Frank C. Peterson, Joplin, Mo.; Mical C. Renz, and Leslie P. Theard, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Mar. 4, 1977, Ser. No. 774,442
Int. Cl.[2] C08K *7/14;* **C08L** *63/00*
U.S. Cl. 260—42.18 **16 Claims**

1. A method of forming a handleable, thermosettable composition which comprises

forming a homogeneous liquid resin mixture substantially free of active hydrogen comprising

(a) about five to about 80 weight percent based on the total resin components of an olefinically unsaturated monomer consisting of

(1) one or more alkenes having from about 6 to about 18 carbon atoms and halogen derivatives thereof, and

(2) up to 90 mol percent of styrene, ring-substituted chloro-, bromo or lower alkylstyrenes, lower alkylacrylates, lower alkylmethacrylates, vinyl acetate, acrylonitrile, vinyl chloride, vinyl bromide or vinylidene chloride;

(b) an anhydride component consisting of

(1) an olefinically unsaturated monoanhydride selected from maleic anhydride, chloromaleic anhydride, methylmaleic anhydride, ethylmaleic anhydride, dichloromaleic anhydride, dimethylmaleic anhydride, n-butylmaleic anhydride, phenylmaleic anhydride, diphenylmaleic anhydride, chloromethylmaleic anhydride, bromophenylmaleic anhydride and itaconic anhydride, the molar ratio of the olefinically unsaturated monomer (a) to the olefinically unsaturated monoanhydride (b) (1) being about 1:1;

(2) a saturated polyanhydride comprising the copolymer having between two and about 500 repeating units and prepared from one to 10 mols of said olefinically unsaturated monomer (a) (2) per mol of said unsaturated monoanhydride (b) (1) or prepared from equimolar amounts of said unsaturated monoanhydride (b) (1) and one or more two to 20 carbon 1-alkenes or halogen-substituted 1-alkenes; and

(3) a saturated monoanhydride selected from phthalic anhydride, hexahydrophthalic anhydride, methyltetrahydrophthalic anhydride, dodecenylsuccinic anhydride, chlorendic anhydride, and a mixture of methyl

bicyclo(2.2.1)heptane-2,3-dicarboxylic anhydride isomers;

(4) the ratio of the anhydride equivalents of said olefinically unsaturated monoanhydride (b) (1) to the sum of the total anhydride equivalents in the resin solution being from about 0.2:1 to about 1:1 and the ratio of anhydride equivalents in said saturated polyanhydride (b) (2) to the anhydride equivalents in said saturated monoanhydride (b) (3) being at least about 1:1;

(c) an epoxy component substantially free of active hydrogen selected from

(1) a saturated monoepoxy compound having between three and about 20 carbon atoms, or

(2) an epoxy resin having a 1,2-epoxy equivalent value greater than one which is soluble in the resin solution or is capable of forming a homogeneous dispersion in the resin solution, or a mixture of said saturated monoepoxy compound and said epoxy resin,

(3) said epoxy component having an A/E ratio of total anhydride equivalents to total epoxy equivalents in the resin solution of about 0.1:1 to about 2.5:1; and

(d) from about 0.01 to about 10 weight percent of an anhydride accelerator which is substantially inactive during the copolymerization reaction of said olefinically unsaturated monomer (a) and said anhydride component (b); and

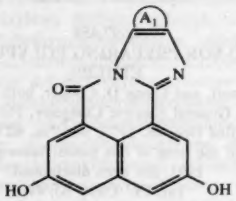
copolymerizing said olefinically unsaturated monomer (a) with said anhydride component (b) by free radical means at a temperature up to about 150° C. without substantial reaction of the anhydride groups with the epoxide groups present in the resin mixture whereby a handleable, thermosettable composition comprising a homogeneous mixture of polyanhydride molecules, epoxide molecules and anhydride accelerator is obtained.

4,097,450
PERINONE COMPOUNDS AS COLORANTS FOR POLYOLEFINS

Theodor Papenfuhs, Frankfurt am Main, and Helmut Tröster, Konigstein, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 723,072, Sep. 14, 1976, abandoned, which is a continuation of Ser. No. 618,800, Oct. 2, 1975, abandoned. This application May 26, 1977, Ser. No. 800,895
Int. Cl.² C08K *5/34*
U.S. Cl. 260—42.21 **2 Claims**

1. In a process wherein a pigment is incorporated into a polyolefin, the improvement consisting essentially of employing as pigment a compound of the formula



wherein A_1 is phenylene which is unsubstituted or substituted by 1 or 2 substituents selected from fluorine, chlorine, bromine, lower alkyl, lower alkoxy, phenyl, phenoxy, hydroxy, benzyloxy, lower alkanoylamino, benzoylamino, lower alkylsulfonyl, nitro, nitrile, trifluoromethyl, carboxy, carbalkoxy of 2 to 5 carbon atoms and carboxylic or sulfonic acid amide which is unsubstituted or substituted at the nitrogen by 1 or 2 radicals selected from lower alkyl, phenyl or nitrophenyl.

4,097,451
FLAME-RETARDANT RESINOUS COMPOSITIONS

Donald A. Keyworth, Houston, Tex.; Eugene P. Di Bella, Piscataway, and Marvin Rosen, Warren, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 423,565, Dec. 10, 1973, abandoned. This application Apr. 24, 1974, Ser. No. 463,566
Int. Cl.² C08K *5/02*
U.S. Cl. 260—45.7 R **8 Claims**

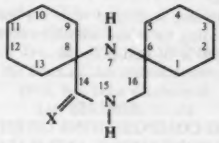
1. A flame-retardant resinous composition comprising a thermoplastic organic polymer selected from the group consisting of polyolefins and vinyl chloride polymers and a flame-retarding amount of 1,1,2,3,4,4-hexabromobutene-2.

4,097,452
14-SUBSTITUTED 7,15-DIAZADISPIRO-[5.1.5.3]-HEXADECANES AS UV STABILIZERS

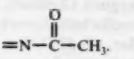
Norbert Mayer, Gersthofen; Gerhard Pfahler, Augsburg, and Hartmut Wiezer, Gersthofen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 16, 1977, Ser. No. 769,331
Claims priority, application Germany, Feb. 20, 1976, 2606819
Int. Cl.² C08K *5/34*
U.S. Cl. 260—45.8 N **7 Claims**

5. Plastics compositions consisting of a polyolefin, a chlorine-containing polyolefin, a polyacetal, polyester, polyurethane or epoxy resin and as stabilizer 0.1 – 5% by weight of the polymer of a compound of the formula



wherein X is = O, = NH or



4,097,453
PROCESS FOR THE PREPARATION OF ETHERIFIED ACETAL POLYMERS

Pierino Radici, Turate (Como); Sergio Custro, Goria Maggiore (Varese), and Paolo Colombo, Saronno (Varese), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 22, 1975, Ser. No. 642,811
Claims priority, application Italy, Dec. 20, 1974, 30831/74
Int. Cl.² C08K *5/42*
U.S. Cl. 260—45.9 P **19 Claims**

1. A method for the etherification of the unstable terminal hydroxyl groups of an acetal polymer, which comprises bringing said acetal polymer into contact with an etherification reagent selected from the group consisting of orthoesters, epoxides and acetals in the presence of 4-(p-toluenesulphonamide) diphenylamine as an additive stabilizer and subsequently etherifying said acetal polymer in a liquid reaction medium at a temperature of from 50° to 200° C wherein said additive is present in an amount of from 0.05 to 5 parts by weight of said liquid reaction medium.

4,097,454

BENZOPHENONE BASE STABILIZING AGENT FOR POLYMERS AND POLYMERS STABILIZED THEREBY

Antonio Tozzi, Sasso Marconi, and Paolo Cassandrini, Bologna, both of Italy, assignors to Chimosa Chimica Organica S.p.A., Bologna, Italy

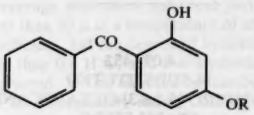
Continuation of Ser. No. 476,340, Jun. 4, 1974, abandoned. This application Jun. 10, 1976, Ser. No. 694,591

Claims priority, application Italy, Jun. 8, 1973, 50569

Int. Cl.[2] C08K *5/13*

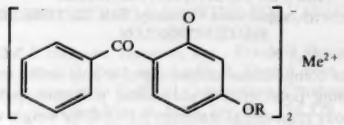
U.S. Cl. 260—45.75 N **8 Claims**

1. A stabilizer for polypropylene against the action of light, comprising a mixture containing substantially equal proportions of compounds of the formula



(I)

wherein R is a linear alkyl chain from 1 to 18 carbon atoms, with compounds of the formula



wherein Me is Ni or Co, and R is a linear alkyl chain from 1 to 18 carbon atoms.

6. A polypropylene stabilized with the stabilizer according to claim **1** by adding to it said stabilizer to the proportion of 0.05 to 1.5 weight % of said polymer.

4,097,455

MOULDING COMPOSITIONS OF MIXTURES OF HALOGEN-CONTAINING AND HALOGEN-FREE POLYFUNCTIONAL AROMATIC CYANIC ACID ESTERS

Claus Burkhardt; Karl-Heinrich Meyer, both of Krefeld, and Kurt Weirauch, Bergisch Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 17, 1977, Ser. No. 778,713

Claims priority, application Germany, Mar. 23, 1976, 2612312

Int. Cl.[2] C08G *18/76*

U.S. Cl. 260—47 CB **6 Claims**

1. Moulding compositions for the production of mouldings with fire-retarding properties comprising mixtures of

(A) 10 to 90% by weight of at least one polyfunctional, aromatic halogen-free cyanic acid ester or a prepolymer thereof which is still fusible or soluble in solvents, and

(B) 10 to 90% by weight of at least one polyfunctional, aromatic halogen-containing cyanic acid ester or a prepolymer thereof which is still fusible or soluble in solvents.

4,097,456

PREPARATION OF ACETYLENE-SUBSTITUTED POLYIMIDE OLIGOMERS AND POLYIMIDE POLYMERS

Walter P. Barie, Jr., Shaler Township, Allegheny County, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 28, 1977, Ser. No. 782,001

Int. Cl.[2] C08G *73/12*

U.S. Cl. 260—47 UA **22 Claims**

1. A process for the preparation of an acetylene-substituted polyimide oligomer which comprises

reacting a stoichiometric excess of a dianhydride of an aromatic tetracarboxylic acid, or a lower alkyl diester of said aromatic tetracarboxylic acid, with an aromatic diamine to form an anhydride-capped polyamic acid or acid-ester-capped analog in the presence of at least a sufficient amount of a solvent consisting essentially of N-methyl-2-pyrrolidone to form a solution at elevated temperatures;

thereafter reacting said anhydride-capped polyamic acid or analog with an aminoarylacetylene compound in the presence of said solvent to produce an acetylene-terminated polyamic acid oligomer;

converting said acetylene-terminated polyamic acid oligomer to the corresponding polyimide in the continued presence of at least a portion of said solvent;

and thereafter recovering the desired acetylene-substituted polyimide oligomers substantially free of said solvent.

4,097,457

PROCESS FOR PREPARING HIGH MOLECULAR WEIGHT POLYCARBONATES

Takeaki Megumi, Sakai, and Shigeo Kondo, Toyonaka, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 3, 1975, Ser. No. 637,307

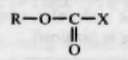
Claims priority, application Japan, Dec. 9, 1974, 49-141319

Int. Cl.[2] C08G *63/62*

U.S. Cl. 260—47 XA **14 Claims**

1. A process for preparing a high molecular weight polycarbonate comprising

(A) reacting phosgene with a dihydroxydiarylalkane at a temperature of from 0° to 80° C in the presence of an acid acceptor and a solvent by adding a monohydric phenol and at least one member selected from the group consisting of compounds having the formulas



(2)

where R is a hydrocarbon residue having 1 to 10 carbon atoms selected from the group consisting of saturated aliphatic hydrocarbon residues, aliphatic hydrocarbon residues having an aromatic group substituent and alicyclic hydrocarbon residues; X is chloro or bromo; the quantity of monohydric phenol is from 0.1 to 5 mole percent, based on the dihydroxydiarylalkane; and the amount of compound according to Formulas (1) and (2) is from 0.5 to 100 mole percent, based on the dihydroxydiarylalkane, to produce a polycarbonate prepolymer having the chains terminated with residues of compounds (1) and/or (2) and an intrinsic viscosity of 0.01 to 0.40, determined with an Ostwald viscosimeter in methylene chloride at 25° C, and

(B) heating and melting under reduced pressure the prepolymer so formed to cause polycondensation thereof at a temperature of 220° to 320° C.

4,097,458

METHOD FOR PREPARING POLYPHENYLENE ETHERS

James G. Bennett, and Glenn D. Cooper, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 26, 1973, Ser. No. 427,996

The portion of the term of this patent subsequent to Feb. 24, 1991, has been disclaimed.

Int. Cl.[2] C08G *65/44*

U.S. Cl. 260—47 ET **13 Claims**

1. In a process for forming a polyphenylene ether by an oxidative coupling reaction in the presence of a catalyst which comprises a complexed metal ion and an amine, said process comprising passing an oxygen-containing gas through a reaction solution of a phenol and said catalyst, the improvement which comprises separating the catalyst from the polyphenylene ether by the addition of a sufficient amount of a complexing agent selected from the group consisting of biguanide,

di-o-tolylbiguanide, dicyanodiamide and L-Arginine to produce a complexed catalyst mixture and the polyphenylene ether and thereafter separating the polyphenylene ether from said mixture.

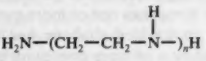
4,097,459

METHOD FOR PREPARING POLYPHENYLENE ETHERS

James G. Bennett, and Glenn D. Cooper, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 26, 1973, Ser. No. 428,450
The portion of the term of this patent subsequent to Sep. 24, 1991, has been disclaimed.
Int. Cl.[2] C08G 65/44
U.S. Cl. 260—47 ET 13 Claims

1. In a process for forming a polyphenylene ether by an oxidative coupling reaction in the presence of a catalyst which comprises a complexed metal ion and an amine, said process comprising passing an oxygen-containing gas through a reaction solution of a phenol and said catalyst, the improvement which comprises separating the catalyst from the polyphenylene ether by the addition of a sufficient amount of a complexing agent selected from compounds of the formula



and mixtures thereof wherein n is a positive integer of from 1 to 10, to produce a mixture of a complexed catalyst and the polyphenylene ether and thereafter separating the polyphenylene ether from said mixture.

4,097,460

POLY(ARYLACETYLENES) AND THERMOSET RESINS THEREFROM

Harold Jabloner, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 165,592, Jul. 23, 1971, abandoned. This application Jun. 12, 1972, Ser. No. 262,166
Int. Cl.[2] C08G 65/00, 67/00; C08F 38/00
U.S. Cl. 260—47 UA 10 Claims

1. A polyacetylenically unsaturated prepolymer consisting essentially of a polycyclotrimerization polymer of at least one polyacetylenically substituted aromatic compound selected from the group consisting of diethynylbenzene; diethynyltoluene; diethynylxylene; diethynylbiphenyl; 9,10-diethynylanthracene; 9,10-diethynylphenanthrene; di(ethynylphenyl)ether; 1-chloro-2,5-diethynylbenzene; 2,3,5,6-tetrachloro-1,4-diethynylbenzene; 4,4'-diethynyl-trans-azobenzene; diphenylbutadiyne; 2,2'-dichlorodiphenyldiacetylene; 4,4'-dichlorodiphenyldiacetylene; 4,4'-dibromodiphenyldiacetylene; di-p-tolyldiacetylene; di-α-naphthyldiacetylene; dibenzyldiacetylene; 1,4-bis(phenylethynyl)benzene; 1,3-bis(phenylethynyl)benzene; 9,10-bis(phenylethynyl)anthracene; 1,3,5-triethynylbenzene; 1,2,4-triethynylbenzene; 1,3,5-tris(phenylethynyl)-2,4,6-triphenylbenzene; 1,2,4-tris(phenylethynyl)-3,5,6-triphenylbenzene; tris(ethynylphenyl)benzene and mixtures of at least one of said compounds with phenylacetylene, said prepolymer having a number average molecular weight of from about 900 to about 12,000, a ratio of aromatic protons to olefinic protons from about 2.4:1 to about 38:1 and containing from about 5 to about 20% terminal acetylenic groups by weight of the prepolymer.

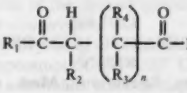
4,097,461

OXIDATIVE COUPLING OF ALKYLPHENOLS OR 1-NAPHTHOLS CATALYZED BY METAL COMPLEXES OF DIKETO COMPOUNDS

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Dec. 3, 1976, Ser. No. 747,183
Int. Cl.[2] C08G 65/44
U.S. Cl. 260—47 ET 18 Claims

1. A method of preparing a condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol", by an oxidative coupling reaction said method comprising contacting a mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of sufficient amount of alkaline material to sustain pH in the range of about 5–10 during the oxidative coupling reaction and a catalyst system comprising a cupric, manganous, cobaltous, or chromic metal complex of diketone or keto ester having the structural formula



wherein R_1 and R_5 may be independently linear, branched or cyclic alkyl or alkoxy or may be joined together to form a saturated or unsaturated cyclic compound; R_2, R_3 and R_4 may be independently hydrogen, halogen, alkoxy, alkyl, or aryl; and n is 0 or 1.

4,097,462

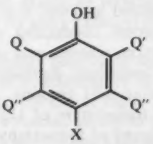
PROCESS FOR MAKING POLYPHENYLENE OXIDES

Walter Karl Olander, Clifton Park, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Jan. 23, 1976, Ser. No. 651,682
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.[2] C08G 65/44
U.S. Cl. 260—47 ET 12 Claims

1. A process for the preparation of a polyphenylene oxide resin composition which comprises the steps of:

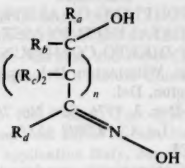
a. oxidatively coupling a phenolic monomer having the formula



wherein X is a substituent selected from the group consisting of hydrogen, chlorine, bromine and iodine, Q is a monovalent substituent selected from the group consisting of hydrocarbon radicals, halohydrocarbon radicals having at least two carbon atoms between the halogen atom and the phenol nucleus, hydrocarbonoxy radicals and halohydrocarbonoxy radicals having at least two carbon atoms between the halogen atom and the phenol nucleus; and Q′ is as defined for Q, and in addition, halogen, and Q″ are each as defined for Q′ and in addition hydrogen with the proviso that Q, Q′ and Q″ are all free of a tertiary carbon atom in the presence of oxygen in a basic reaction medium to form a polyphenylene oxide resin in the presence of an organic solvent and a manganese (II) chelate complex of the formula:

(L)x Mn

wherein L is a ligand derived from a ω-hydroxyoxime of the formula



wherein R_a, R_b, R_c, R_d and n are selected from the group consisting of hydrogen, acyclic and cyclic organic radicals and n is a positive integer equal to 0 or 1, Mn is the transition metal manganese (II) and x is at leat equal to about 0.5;

b. adding an antisolvent to the reaction mixture of (a) to precipitate out the polymer and catalyst to obtain a polyphenylene oxide resin composition.

4,097,463

PROCESS FOR PREPARING HIGH ORTHO NOVOLAC RESINS

Harry M. Culbertson, Belchertown, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 10, 1977, Ser. No. 758,371
Int. Cl.[2] C08G *8/10*
U.S. Cl. 260—57 A **7 Claims**

1. In a process for the production of phenol-aldehyde novolac resins of the class which is characterized by having a preponderance of ortho/ortho methylene bridges and which is prepared by an acid reaction mixture containing a material selected from the group consisting of phenol and meta-alkylphenols in molar excess with a source of formaldehyde, conducting said reacting in the presence of a catalyst system comprising in combination:

(A) a divalent electropositive metal compound selected from the group consisting of oxides, hydroxides, organic acid salts, sulfonic acid salts, halogen acid salts and fluoroborate acid salts of said metals or mixtures thereof, and

(B) an acid material selected from the group consisting of halogen, fluoroboric and sulfonic acids and divalent metal salts of said acids or mixtures thereof, said catalyst system being at least partially soluble in said reaction mixture and being present amounts such that the pH of said reaction mixture is maintained at about 4 to 7, wherein the improvement comprises conducting said reacting under anhydrous conditions wherein said anhydrous conditions are provided by azeotropic distillation and removal of a water phase during said reacting, said reacting being carried out at a temperature of 115° to 145° C. with a molar ratio of phenol to formaldehyde of about 1.2:1 to 2.0:1 providing said novolac resin with about 80 to 95% ortho-ortho methylene bridges said novolac having a weight average molecular weight greater than 400.

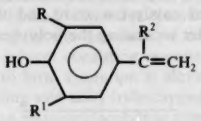
4,097,464

2,6-DI-TERT-ALKYL-4-VINYLPHENOLS AS POLYMERIZABLE ANTIOXIDANTS

Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 3, 1975, Ser. No. 628,685
Int. Cl.[2] C08F *236/06, 36/06, 216/02*
U.S. Cl. 260—62 **6 Claims**

1. A process of preparing a self-stabilizing diene polymer comprising polymerizing in a free radical emulsion polymerization system a monomer system comprised of at least 40 parts by weight of diene monomer and 0.10 to 10 parts by weight of at least one phenolic monomer having the following structural formula



wherein R and R^1 are tertiary alkyl radicals containing from 4 to 8 carbon atoms and R^2 is selected from the group consisting of hydrogen and methyl and wherein all parts are parts by weight per 100 parts of total monomer.

4,097,465

LIQUID COATING COMPOSITIONS

Dieter Berger, Marl, Germany, assignor to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Filed May 14, 1976, Ser. No. 686,484
Claims priority, application Germany, May 17, 1975, 2522045
Int. Cl.[2] C08G *63/12*
U.S. Cl. 260—75 EP **11 Claims**

1. In an epoxy resin-based liquid varnish coating composition whose binder comprises one or more cyclic anhydrides of saturated and/or unsaturated aliphatic and/or cycloaliphatic dicarboxylic acids, or a mixture consisting essentially of carboxylic acid anhydrides of saturated and/or unsaturated aliphatic and/or cycloaliphatic and aromatic dicarboxylic acids, wherein the melting point of the anhydride or anhydride mixture is below 100° C., the improvement wherein the coating composition contains at most up to 25% volatile solvent, the binder is a mixture of A) glycidyl esters and B) one or more of said anhydrides, in a ratio such that the binder contains 0.7 - 1.5 anhydride equivalents per epoxide equivalent of glycidyl ester, wherein the glycidyl esters have 1.5 - 2.5 epoxide equivalents/mole, an epoxy number of 0.2 - 0.4 epoxide equivalents/100 g., a hydroxyl number of 20-130 mg. KOH/g. and a number average molecular weight of 450-800, and are prepared by glycidylating an esterification product containing free carboxyl groups with a molar excess of a 2,3-epoxyhaloalkane in the presence of an agent which splits off hydrogen halide, said esterification product having an acid number 220–350 mg. KOH/g., a hydroxyl number of 0–100 mg. KOH/g., an average molecular weight of 350–600 and an average degree of polymerization of 2.8 - 3.5 and wherein the esterification product is prepared by condensing a reaction mixture consisting essentially of:

(a) 100-50 molar percent of at least one aliphatic or cycloaliphatic diol wherein the hydroxyl functions are separated from each other by 2–12 carbon atoms and 0–2 of said carbon atoms are substituted by an oxygen atom which oxygen atoms when present are separated by at least 2 carbon atoms from each other and from the hydroxyl groups, and correspondingly 0-50 molar percent of at least one aliphatic polyol of 3–6 carbon atoms and 3 and 4 hydroxyl groups; and

(b) a mixture of 15–50 molar percent of at least one saturated aliphatic dicarboxylic acid of 4–12 carbon atoms or an intramolecular anhydride thereof, and correspondingly 85-50 molar percent of at least one aromatic or cycloaliphatic dicarboxylic acid other than terephthalic acid of 6-12 ring carbon atoms or an intramolecular anhydride thereof, or a corresponding mixture thereof and up to 30 molar percent of an aromatic polycarboxylic acid having 3 or more carboxyl groups or an intrmolecular anhydride thereof.

4,097,466

LIQUID COATING COMPOSITIONS

Dieter Berger, Marl, Germany, assignor to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Filed May 14, 1976, Ser. No. 686,483
Claims priority, application Germany, May 17, 1975, 2522044
Int. Cl.[2] C08G *63/12*
U.S. Cl. 260—75 EP 10 Claims

1. In an epoxy resin based liquid varnish coating composition whose binder comprises one or more cyclic anhydrides of saturated and/or unsaturated aliphatic and/or cycloaliphatic dicarboxylic acids, or a mixture consisting essentially of carboxylic acid anhydrides of saturated and/or unsaturated aliphatic and/or cycloaliphatic and aromatic dicarboxylic acids, wherein the melting point of the anhydride or anhydride mixture is below 100° C., the improvement wherein the coating composition contains at most up to 25% volatile solvent and the binder is a mixture of A) glycidyl esters and B) one or more of said anhydrides, in a ratio such that the binder contains 0.7 -1.5 anhydride equivalents per epoxide equivalent of glycidyl ester, wherein the glycidyl esters have 1.6 - 2.8 epoxide equivalents/mole, an epoxy number of 0.1 - 0.35 epoxide equivalents/100 g., a hydroxyl number of 20–130 mg. KOH/g. and a number average molecular weight of 600–2000 and are prepared by glycidylating an esterification product containing free carboxyl groups with a molar excess of a 2,3-epoxyhaloalkane in the presence of an agent which splits off hydrogen halide, said esterification product having an acid number of 60–220 mg. KOH/g., a hydroxyl number of 0–100 mg. KOH/g., an average molecular weight of 550–1800 and an average degree of polymerization of 4.8–15, and wherein the esterification product is prepared by condensing a reaction mixture consisting essentially of:

(a) 100–50 molar percent of at least one aliphatic or cycloaliphatic diol wherein the hydroxyl functions are separated from each other by 2–12 carbon atoms and 0–2 of said carbon atoms are substituted by an oxygen atom which oxygen atoms when present are separated by at least 2 carbon atoms from each other and from the hydroxyl groups, and correspondingly 0–50 molar percent of at least one aliphatic polyol of 3–6 carbon atoms and 3 or 4 hydroxyl groups; and

(b) a mixture of 15–40 molar percent of at least one saturated aliphatic dicarboxylic acid of 4–12 carbon atoms or an intramolecular anhydride thereof, and correspondingly 85–60 molar percent of at least one aromatic or cycloaliphatic dicarboxylic acid other than terephthalic acid of 6–12 ring carbon atoms or an intramolecular anhydride thereof, or a corresponding mixture thereof and up to 30 molar percent of an aromatic polycarboxylic acid having 3 or more carboxyl groups or an intramolecular anhydride thereof.

4,097,467

PROCESS FOR THE PREPARATION OF A COPOLYMERIZABLE COMPOSITION

Lodewijk Roskott, Gorssel, and Arnold Schroeder, Deventer, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jun. 20, 1975, Ser. No. 588,993
Claims priority, application Netherlands, Jun. 21, 1974, 7408353
Int. Cl.[2] C08G *63/52*; C08L *67/06*
U.S. Cl. 260—75 UA 2 Claims

1. In an improved process for the preparation of a copolymerizable composition containing an unsaturated polyester resin, a peroxide initiator and a metal accelerator, wherein the improvement comprises the step of incorporating in said composition as the peroxide initiator a peroxide composition consisting essentially of an alkylaldehyde peroxide which may be synthesized by reacting an alkylaldehyde with hydrogen peroxide, said alkyl aldehyde peroxide being selected from the group consisting of an unsubstituted alkylaldehyde peroxide, and alkyl-substituted alkyladlehyde peroxide, and an aryl-substituted alkylaldehyde peroxide, and said alkylaldehyde peroxide containing not more than 20 carbon atoms and at least 1.5 active oxygen atoms per carbonyl group of said alkylaldehyde.

4,097,468

PROCESS FOR PREPARING POLYESTERS

Leonard Evans James, Richmond; Laszlo Joseph Balint, Chester, and Stanley David Lazarus, Petersburg, all of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Mar. 15, 1977, Ser. No. 777,819
Int. Cl.[2] C08G *63/18*
U.S. Cl. 260—75 M 8 Claims

1. In a continuous process for the preparation of high molecular weight linear polyesters of terephthalic acid which comprises partially esterifying terephthalic acid with an alkylene glycol containing 2 to 10 carbon atoms per molecule under direct esterification conditions and then further esterifying and polycondensing the partially esterified product until there is obtained a polyester of the desired molecular weight, the improvement which comprises:

(a) continuously subjecting to conditions of direct esterification at a temperature of 270°–280° C. and a pressure of 100–150 psig a flowable, uniform dispersion comprised of (1) a paste consisting of said terephthalic acid, about 1.0 to 1.2 mols of said alkylene glycol per mole of terephthalic acid, and about 0.4 to 1.8 mols of water per mol of terephthalic acid, and (2) about 20 to about 40 parts by weight per part of paste of a partially esterified product of said terephthalic acid with said alkylene glycol, said partially esterified product having a reacted glycol to terephthalic acid mol ratio between 0.9 and 1.2 and a carboxyl conversion of about 70 to 80 percent, said partially esterified product being continuously recycled to the esterification zone at a temperature of 270°–280° C. and a pressure of 100–150 psig and said paste being continuously added thereto at a predetermined point in the recycle system;

(b) continuously withdrawing a portion of the partially esterified product from step (a) equivalent to the terephthalic acid added in step (a), and continuously reacting said portion of the partially esterified product with about 0.5 to 0.7 mol of said alkylene glycol per mol of terephthalic acid added in step (a), said reaction being carried out at a temperature of 270°–280° C. and a pressure of 90–100 psig, thereby producing an esterified product having a reacted glycol to terephthalic acid mol ratio between 1.4 and 1.6 and a carboxyl conversion of about 90 to 95 percent;

(c) continuously further esterifying the esterification product of step (b) at a temperature of 270°–280° C. and a pressure of 300 to 400 mm of Hg to produce an esterified product having a reacted glycol to terephthalic acid mol ratio between 1.1 and 1.2 and a carboxyl conversion of 97 to 99 percent; and

(d) continuously further esterifying and polycondensing the esterification product of step (c) at a temperature of 260°–300° C. and a pressure less than 300 mm Hg until there is obtained an improved polyester of the desired molecular weight, whereby the molecular weight distribution of said polyester is restricted so that the ratio of the weight average molecular weight to the number average molecular weight is less than 2.25.

4,097,469

PROCESS FOR PREPARING POLYAMIDES OF PACP

Robert S. Shue, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 15, 1976, Ser. No. 677,210
Int. Cl.[2] C08G *69/28*
U.S. Cl. 260—78 R 45 Claims

1. A process for preparing a polyamide which comprises the steps of:

a. heating at least one (A) diamine and at least one (B) diacid

employing a molar ratio of diamine:diacid from about 2.75 percent molar excess of diamine to about 1.75 percent molar excess of diacid, employing an effective amount of a catalyst system comprising manganous hypophosphite and water, at elevated temperatures and pressures, and for a time sufficient, to obtain a prepolymer exhibiting an inherent viscosity in the range of about 0.6 to 0.95 as measured at 0.5 wt. % in m-cresol solution at 30° C, and

b. heating said prepolymer at elevated temperatures under substantially vacuum conditions for an effective time, thereby polycondensing said prepolymer to a polyamide product exhibiting an inherent viscosity higher than that of said prepolymer, and in the range of about 1 to 1.8,

wherein said (A) diamine is 2,2-bis(4-aminocyclohexyl)propane or methyl derivatives thereof wherein each cyclohexyl ring has 0–1 methyl group, and

wherein said (B) diacid is an alkane straight chain dicarboxylic acid selected from the group consisting of (B1) at least one C_8 to C_{12} diacid, and (B2) adipic acid and at least one C_8 to C_{12} diacid.

4,097,470

PREPARATION OF BIOGICALLY ACTIVE SUBSTANCES BEARING -NH_2 GROUPS IN A FORM RELEASABLE BY ENZYMATIC CLEAVAGE

Jaroslav Drobník; Jindřich Kopeček; Jiří Labský; Pavla Rejmanová; Josef Exner, and Jaroslav Kalal, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Jun. 9, 1975, Ser. No. 584,887

Claims priority, application Czechoslovakia, Apr. 25, 1974, 2958-74

Int. Cl.[2] C08F *16/28, 24/00, 210/00*

U.S. Cl. 260—78 A **9 Claims**

1. Polymeric form of a biologically active compound containing at least one —NH_2 group adapted for the protracted release of the biologically active compound by enzymatic cleavage of the polymer in vivo in the organism comprising a copolymer of 1) a compound in which said active compound is bonded by its —NH_2 group to the carboxylic group of an L-amino acid which in twin is bonded by its amino group to the terminal carboxylic group of the side chain of a substituted amide or ester of acrylic or methacrylic acid, said side chain containing a linear moiety containing at least three carbon atoms, with 2) a hydrophilic monomer selected from the group of N-alkylmethacrylamide, N-alkylacrylamide, N,N-dialkylacrylamide, wherein alkyl has 1 to 6 carbon atoms and may contain 1 to 3 OH groups, glycol methacrylate, glycol acrylate, and mixtures thereof.

4,097,471

POLYPEPTIDES WITH MORPHINE-LIKE ACTIVITY

Dimitrios Sarantakis, West Chester, and Larry Stein, Haverford, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed May 26, 1977, Ser. No. 800,678

Int. Cl.[2] C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **2 Claims**

1. A polypeptide of the formula:

H-Tyr-Gly-Gly-Phe-Leu-Thr-Ser-Glu-Lys-Ser-Gln-Thr-Pro-Leu-Val-Thr-OH

or a non-toxic salt thereof, all optically active amino acids being of the L-configuration.

4,097,472

N^2-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Machida; Yoshikuno Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of, Japan

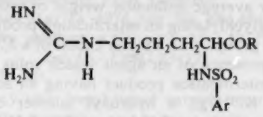
Continuation-in-part of Ser. No. 707,536, Jul. 22, 1976, Pat. No. 4,036,955, Ser. No. 723,474, Sep. 14, 1976, Ser. No. 728,051, Sep. 30, 1976, Ser. No. 671,436, Mar. 29, 1976, Pat. No. 4,066,758, and Ser. No. 671,568, Mar. 29, 1976, Pat. No. 4,049,645, said Ser. No. 671,436, and Ser. No. 671,568, each is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,676

The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.

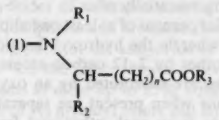
Int. Cl.[2] C07C *103/52;* **A61K** *37/00*

U.S. Cl. 424—177 **6 Claims**

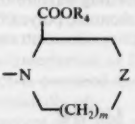
1. An N^2-arlysulfonyl-L-argininamide having the formula (I):



or a pharmaceutically acceptable salt thereof, wherein R is

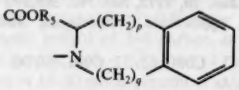


wherein R_1 is furfuryl, 3-furylmethyl, tetrahydrofurfuryl or tetrahydro-3-furylmethyl; R_2 is hydrogen, C_1 – C_{10} alkyl, carboxy, C_2 – C_{10} alkoxycarbonyl, phenyl optionally substituted with one or more C_1 – C_5 alkyl, C_1 – C_5 alkoxy or mixtures thereof, C_7 – C_{12} aralkyl or ring substituted benzyl wherein said substituent is C_1 – C_5 alkyl or C_1 – C_5 alkoxy; R_3 is hydrogen, C_1 – C_{10} alkyl, C_6 – C_{10} aryl, C_7 – C_{12} aralkyl or 5-indanyl; and *n* is o, 1 or 2,



(2)

where in R_4 is hydrogen, C_1 – C_{10} alkyl, C_6 – C_{10} aryl, C_7 – C_{12} aralkyl or 5-indanyl; Z is oxy, thio or sulfinyl; and *m* is 0 or 1, or



(3)

wherein

R_5 is hydrogen, C_1 – C_{10} alkyl, C_6 – C_{10} aryl, C_7 – C_{12} aralkyl or 5-indanyl; *p* is 0, 1 or 2; *q* is 0, 1 or 2: and $p + q$ is 1 or 2:

and Ar is naphthyl substituted with at least one substituent selected from the group consisting of halo, hydroxy, nitro, cyano, C_1 – C_{10} alkyl, C_1 – C_{10} alkoxy and C_2 – C_{20} dialkyamino, and at least one substituent selected from the group consisting of sulfoamino, carbamoyl, C_3 – C_{10} N,N-

dialkylcarbamoyl, amino, $C_1 - C_{10}$ alkylamino, mercapto, $C_1 - C_{10}$ alkylthio, $C_7 - C_{12}$ aralkyl, carboxyl, $C_2 - C_{10}$ alkoxycarbonyl, $C_2 - C_{10}$ carboxyalkyl, $C_1 - C_{10}$ acylamino, $C_2 - C_{10}$ alkylcarbonyl, $C_1 - C_{10}$ hydroxyalkyl, $C_1 - C_{10}$ haloalkyl and phenyl optionally substituted with at least one hydroxy $C_1 - C_5$ alkoxy or mixtures thereof, naphthyl substituted with at least one substituent selected from the group consisting of sulfoamino, carbamoyl, $C_3 - C_{10}$ N,N-dialkylcarbamoyl, amino, $C_1 - C_{10}$ alkylamino, mercapto, $C_1 - C_{10}$ alkylthio, $C_7 - C_{12}$ aralkyl, carboxyl, $C_2 - C_{10}$ alkoxycarbonyl, $C_2 - C_{10}$ carboxyalkyl, $C_1 - C_{10}$ acylamino, $C_2 - C_{10}$ alkylcarbonyl, $C_1 - C_{10}$ hydroxyalkyl, $C_1 - C_{10}$ haloalkyl and phenyl optionally substituted with at least one hydroxy, $C_1 - C_5$ alkoxy or mixtures thereof;

5,6,7,8-tetrahydronaphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, $C_1 - C_{10}$ alkyl, $C_1 - C_{10}$ alkoxy, sulfoamino carbamoyl, $C_3 - C_{10}$ N,N-diakylcarbamoyl, amino, $C_1 - C_{10}$ alkylamino, mercapto, $C_1 - C_{10}$ alkylthio, $C_7 - C_{12}$ arakyl, carboxyl, $C_2 - C_{10}$ alkoxycarbonyl, $C_2 - C_{10}$ carboxyalkyl, $C_1 - C_{10}$ acylamino, $C_2 - C_{10}$ alkylcarbonyl, $C_1 - C_{10}$ hydroxyalkyl, $C_1 - C_{10}$ haloaklyl, oxo, and phenyl optionally substituted with at least one hydroxy; $C_1 - C_5$ alkoxy or mixtures thereof;

naphthoquinonyl, anthyrl, phenanthryl, pentalenyl, heptalenyl, azulenyl, biphenylenyl, as - indacenyl, S-indacenyl, acenaphthylenyl, phenylcarbonylphenyl, phenoxyphenyl, benzofurayl, isobenzofuranyl, benzo [b] thienyl, isobenzothienyl oxanthrenyl, thianthrenyl, dibenzofuranyl, dibenzothienyl, phenoxathiinyl, indolyl, 1H-indazolyl, quinolyl, isoquinolyl, phthalazinyl, 1,8-naphthyridinyl, quinoxalinyl, quinazolinyl, cinnolinyl, carbazolyl, acridinyl, phenazinyl, phenothiazinyl, phenoxazinyl or benzimidazolyl group any of which is unsubstituted or substituted with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, $C_1 - C_{10}$ alkyl, $C_1 - C_{10}$ alkoxy, $C_2 - C_{20}$ dialkylamino, sulfoamino carbamoyl, $C_3 - C_{10}$ N,N-dialkylcarbamoyl, amino, $C_1 - C_{10}$ alkylamino, mercapto, $C_1 - C_{10}$ alkylthio, $C_7 - C_{12}$ aralkyl, carboxyl, $C_2 - C_{10}$ alkoxycarbonyl, $C_2 - C_{10}$ carboxyalkyl, $C_1 - C_{10}$ acylamino, $C_2 - C_{10}$ alkylcarbonyl, $C_1 - C_{10}$ hydroxyalkyl, $C_1 - C_{10}$ haloalkyl and phenyl optionally substituted with at least one hydroxy $C_1 - C_5$ alkoxy or mixtures thereof.

4,097,473

PRODUCTION OF SERUM ALBUMIN

Charles Lewis, Jr., Hazelwood, and James M. Schuck, Chesterfield, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 707,906, Jul. 22, 1976, abandoned. This application Aug. 26, 1977, Ser. No. 828,013

Int. Cl.[2] C07G 7/00

U.S. Cl. 260—122 **13 Claims**

1. A method for the production of a serum albumin fraction in high yield and purity from admixture with other blood protein components comprising contacting the albumin-protein mixture with a resinous polymeric material selected from the group consisting of water-insoluble cross-linked polyelectrolyte copolymers of ethylene and maleic anhydride containing pendant dimethylaminopropyl functional groups at a pH of from about 5.0 to about 5.5 and at a temperature of from about 65° C to about 72° C for about 1 to about 4 hours and then adjusting the mixture to a pH of from about 3.5 to about 4.5 to selectively elute the desired albumin therefrom.

4,097,474

PROCESS FOR SULFURIZING NORBORNENYL COMPOUNDS

Herbert Frank Askew; Gerald John Joseph Jayne, both of Wokingham, and John Scotchford Elliott, Beaconsfield, all of England, assignors to Edwin Cooper and Company Limited, Bracknell, England

Continuation-in-part of Ser. No. 541,995, Jan. 17, 1975, abandoned, which is a division of Ser. No. 459,938, Apr. 11, 1974, Pat. No. 3,882,031. This application Mar. 8, 1976, Ser. No. 664,547

Claims priority, application United Kingdom, Apr. 12, 1973, 17728/73

Int. Cl.[2] C07G 17/00

U.S. Cl. 260—139 **40 Claims**

1. A process for preparing a normally liquid, oil-soluble, metal-free, phosphorus-free substance by reacting sulfur with a compound selected from dimers of cyclopentadiene, methylcyclopentadiene and mixtures thereof, said by reacting being carried out in the absence of a solvent or in the presence of a non-polar solvent, the amount of sulfur reacted being 0.1–4 moles per mole of said compound.

4,097,475

DISPERSE MONO- AND BISAZO DYES DERIVED FROM 2-AMINO-4,5-DICYANOIMIDAZOLE

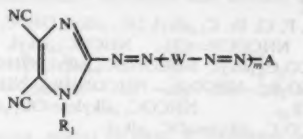
Daniel Shaw James, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 3, 1974, Ser. No. 457,640

Int. Cl.[2] C09B 29/36, 29/38, 31/04

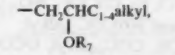
U.S. Cl. 260—157 **23 Claims**

1. An azo dye of the generic formula



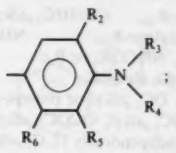
wherein

R_1 is C_{1-4}alkyl, $-CH_2-CH=CH_2$,

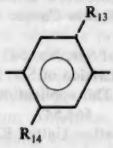


$-(CH_2)_nR_8$, C_{1-4}alkyleneCN, $C_2H_4OR_7$, $-CH_2-CH=CH-R_8$, $-C_2H_4CONH_2$, $-C_2H_4CONHC_{1-4}$alkyl, $-C_2H_4CON(C_{1-4}alkyl)_2$ and $-C_2H_4CO_2C_{1-4}$-alkyl;

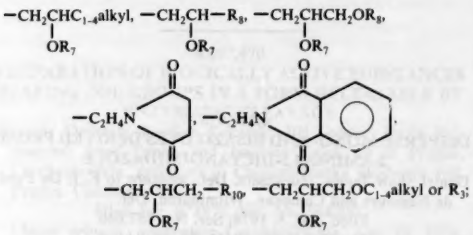
A is a coupling component selected from: a 5-or 6- membered heterocycle consisting of 5-aminopyrazole, 5-pyrazolone, barbituric acid, 6-hydroxypyrid-2-one, 4-hydroxycoumarin and 1,2-dialkylindole; a 1- or 2-naphthol group; and an aromatic amine of the formula



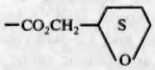
W is 1,4-naphthylene or



R_2 is H, F, Cl, C_{1-4}alkyl, OC_{1-4}alyl;
R_3 is cyclohexyl or C_{1-4}alkylene-R_9;
R_2 and R_3 together with the nitrogen atom optionally form a 6-membered ring optionally substituted with —OH, OC_2H_4CN or $OCOC_{1-5}$alkyl.
R_4 is H,



R_3 and R_4 together optionally form a 6-membered heterocyclic ring containing the nitrogen atom;
R_5 is H;
R_6 is H, F, Cl, Br, C_{1-4}alkyl, OC_{1-4}alkyl, OH, C_{1-4}hydroxyalkyl, $NHCOCH{=}CH_2$, $NHCOC_{1-4}$alkyl, $NHCOR_8$, $NHCO_2C_{1-4}$alkyl, $NHCONHC_{1-4}$alkyl, $NHSO_2C_{1-4}$alkyl, $NHSO_2R_8$, $NHCO_2R_8$, $NHCONHR_8$, $NHCOC_{1-4}$alkylene-R_{10}, $NHCOC_{1-4}$alkylene-OC_{1-4}alkylene-R_{10}, $NHCO_2C_{1-4}$alkyleneOC_{1-4}alkyl;
R_5 and R_6 together optionally form —CH=CH—CH=CH—;
R_7 is H or C_{1-4}acyl;
R_8 is phenyl or phenyl optionally substituted with 1-2 groups selected from Cl, Br, CN, CF_3, NO_2, C_{1-4}alkyl, OC_{1-4}alkyl, $N(C_{1-4}alkyl)_2$ and $NHCOC_{1-4}$alkyl;
R_9 is H, OH, CN, COC_{1-4}alkyl, $OCOCH{=}CH_2$, $OCOC_{1-4}$alkylene-R_{11}, $OCOR_8$, CO_2R_8, CO_2C_{1-4}alkylene-R_{12},



OC_{1-4}alkylene-R_{10}, $CONHC_{1-4}$alkylene-R_{11}, SO_2R_8, $OCONHC_{1-4}$alylene-R_{10}, $NHCOC_{1-4}$alkylene-R_{10}, $NHCONHR_8$, $NHCOR_8$ or R_8;
R_{10} is CN, OH, Cl, Br or R_7;
R_{11} is H, Cl, Br, OC_{1-4}alkyl or phenyl;
R_{12} is H, OH, OC_{1-4}alkyl, $OCOC_{1-4}$alkylene-R_{11} or $OCOR_8$;
R_{13} and R_{14} are independently H, C_{1-4}alkyl, C_{1-4}alkoxy or Cl;
m is 0 or 1; and
n is 1 to 3.

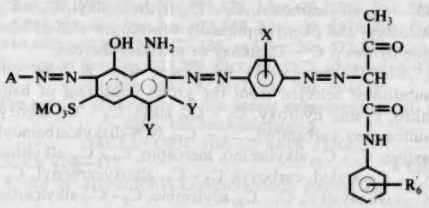
4,097,476

TRISAZO DYES HAVING A 2,7-(1-AMINO-3,6-OR 4,6-DISULFO-8-HYDROXYNAPHTHYLENE) RADICAL

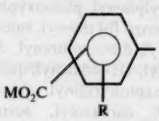
Heinz Wicki, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jun. 10, 1975, Ser. No. 585,663
Claims priority, application Switzerland, Jun. 17, 1974, 8252/74
Int. Cl.[2] C09B *31/24;* D06P *1/06, 3/32*
U.S. Cl. 260—173 **43 Claims**

1. A compound of the formula



or a mixture thereof,
wherein A is sulfonaphthyl, substituted sulfonaphthyl, disulfonaphthyl, substituted disulfonaphthyl or



wherein R is hydrogen, hydroxy, C_{1-4}alkyl or C_{1-4}alkoxy, and
each substituent of substituted sulfonaphthyl and substituted disulfonaphthyl is independently hydroxy or C_{1-4}alkoxy,
X is hydrogen, chloro, C_{1-4}alkyl, C_{1-4}alkoxy, $—SO_3M$ or $—CO_2M$,
one Y is $—SO_3M$ and the other is hydrogen,
R_6' is hydrogen or C_{1-4}alkyl, and
each M is independently hydrogen or a non-chromophoric cation.

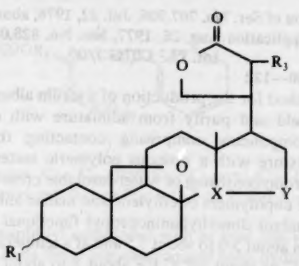
4,097,477

STEROID COMPOUNDS AND PROCESSES THEREOF

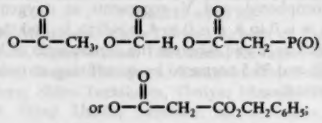
Gunther Kruger, St. Laurent, Canada, assignor to Steele Chemicals Co. Ltd., Pointe Claire, Canada

Continuation-in-part of Ser. No. 516,597, Oct. 21, 1974, abandoned. This application Jul. 9, 1976, Ser. No. 703,825
Claims priority, application Canada, Nov. 29, 1973, 186960
Int. Cl.[2] C07J *17/00, 19/00*
U.S. Cl. 260—239.57 **17 Claims**

1. A compound of the formula



wherein R_1 is H, OH, O, O-acyl,



and R_3 is selected from the group consisting of H, CO_2H, $CO_2CH_2C_6H_5$, CO_2CH_3, $CO_2CH_2CH_2OH$ and CN; X-Y is C=CH or an α-oxide; and the $\Delta 2$, $\Delta 3$, $\Delta 4$, $\Delta 5(6)$, $\Delta 7$ and $\Delta 20(22)$ dehydro analogs thereof.

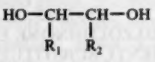
4,097,478

PROCESS FOR PREPARING PYRAZINES

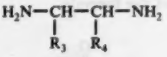
Kanji Sato, Fuji, Japan, assignor to Tokai Denka Kogyo Kabushiki Kaisha, Ohte, Japan

Filed Mar. 31, 1977, Ser. No. 783,172
Claims priority, application Japan, Sep. 20, 1976, 51-111717
Int. Cl.² C07D *241/04, 241/06*
U.S. Cl. 544—353 **7 Claims**

1. A process for preparing pyrazines characterized in that a diol represented by the formula



wherein R_1 and R_2 are each a hydrogen atom or a hydrocarbon radical selected from the group consisting of aliphatic, aromatic and alicylic hydrocarbon radicals, and a diamine represented by the formula



wherein R_3 and R_4 are each a hydrogen atom or a hydrocarbon radical selected from the group consisting of aliphatic, aromatic and alicyclic hydrocarbon radicals, are subjected to a gas phase contact reaction in the presence of a catalyst containing zinc or zinc in combination with at least one other metal selected from the group consisting of cobalt, nickel, iron, aluminum and chromium.

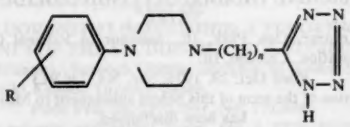
4,097,479

SYNTHESIS OF 5-SUBSTITUTED TETRAZOLES

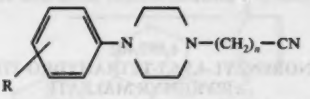
Theodore J. Leipzig, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 11, 1977, Ser. No. 776,619
Int. Cl.² C07D *403/06*
U.S. Cl. 544—366 **4 Claims**

1. In a method for the preparation of tetrazolyl compounds having the formula,



wherein and elsewhere in this claim R is a hydrogen atom, a halogeno, or a trifluoromethyl substituent and *n* is an integer of the set 1–4, by reacting a nitrile of the formula,



with an alkali-metal or ammonium azide in a polar organic solvent, in the presence of a catalyst, and at a temperature near to the boiling point of the solvent, the improvement comprising:

reacting the nitrile and the azide in an amine having a pK_b of from 2 to 6 and a boiling point of from 100° to 250° C as the solvent and in the presence of an acid-addition salt of the amine as the catalyst.

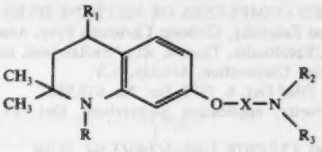
4,097,480

2,2-DIMETHYL-7-AMINE-ALKOXY-4-ARYLTETRAHYDROQUINALINE DERIVATIVES

Derek Victor Gardner, Bishops Stortford, England, assignor to Beecham Group Limited, United Kingdom

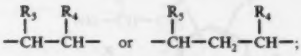
Filed Jun. 1, 1976, Ser. No. 691,866
Claims priority, application United Kingdom, Jul. 28, 1975, 31426/75
Int. Cl.² C07D *215/20;* A61K *31/47*
U.S. Cl. 260—286 R **9 Claims**

1. A compound of the formula (II):



(II)

or a pharmaceutically acceptable acid addition salt thereof wherein X is



R is hydrogen, methyl or ethyl; R_1 is phenyl, naphthyl or phenyl substituted by a member selected from the group consisting of fluorine, chlorine, bromine, methyl, methoxy and trifluoromethyl; R_2 is hydrogen or methyl; R_3 is hydrogen, methyl, ethyl or benzyl; R_4 is hydrogen or methyl; and R_5 is hydrogen or methyl.

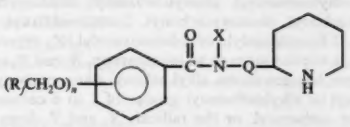
4,097,481

TERTIARY AMIDE DERIVATIVES OF PYRROLIDINE AND PIPERIDINE

Elden H. Banitt, Woodbury, Minn., and William E. Coyne, Hudson, Wis., assignors to Riker Laboratories, Inc., Northridge, Calif.

Filed Nov. 8, 1976, Ser. No. 739,613
Int. Cl.² C07D *211/32*
U.S. Cl. 260—293.77 **2 Claims**

1. A compound of the formula



wherein R_f is a perfluoroalkyl radical containing one to three carbon atoms, *n* is one to three, Q is methylene or methyl-

methylene and X is a cycloalkyl group containing five or six carbon atoms or a pharmaceutically acceptable salt thereof.

4,097,482

5-o-CYANOBENZYL-4,5,6,7-TETRAHYDRO-THIENO[3,2-c]PYRIDINE MALEATE

Armand Amselem, Toulouse, France, assignor to Centre d'Etudes Pour L'Industrie Pharmaceutique, Toulouse, France

Filed Jul. 9, 1976, Ser. No. 703,837
Claims priority, application France, Aug. 6, 1975, 75 24486
Int. Cl.² C07D *513/04*
U.S. Cl. 260—294.8 C **1 Claim**

1. 5-o-cyanobenzyl-4,5,6,7-tetrahydrothieno[3,2-c]pyridine maleate.

4,097,483

PYRAZOLO[1,5-A]PYRIDINES

Tsutomu Irikura, Tokyo, Japan, assignor to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 623,311, Oct. 17, 1975, Pat. No. 4,028,370. This application Aug. 31, 1976, Ser. No. 719,328
Claims priority, application Japan, Nov. 1, 1974, 49-126319
Int. Cl.² C07D *401/02*
U.S. Cl. 260—296 H **1 Claim**

1. 3-(β-ethoxy-α-methylpropionyl)-2-isopropylpyrazolo[1,5-a]pyridine.

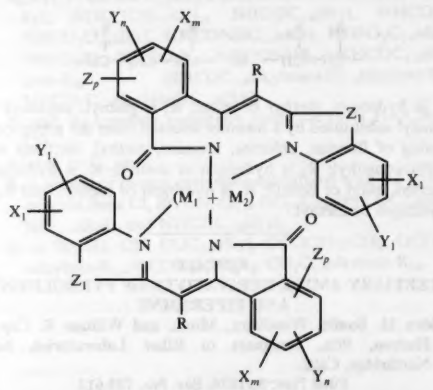
4,097,484

MIXED COMPLEXES OF METHINE DYES

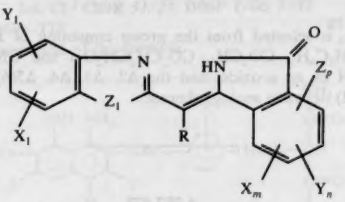
Alexander von Zelewsky, Givisiez; Christoph Frey, Aesch, and Francois L'Eplattenier, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 6, 1975, Ser. No. 619,888
Claims priority, application Switzerland, Oct. 17, 1974, 13920/74
Int. Cl.² C07F *3/06, 7/24, 15/04, 15/06*
U.S. Cl. 260—299 **7 Claims**

1. Mixed complexes of methine dyes of the formula



wherein M_1 represents zinc, cadmium, lead or manganese, M_2 represents cobalt, copper of nickel, R represents an organic radical selected from the group consisting of cyano, carbamoyl, methylcarbamoyl, phenylcarbamoyl, methoxycarbonyl, ethoxycarbonyl, phenoxycarbonyl, 2-benzimidazolyl, methyl, phenyl, 2-benzthiazolyl, or 2-benzoxazolyl, Z_1 represents an oxygen, a sulphur atom or an imino group, X_1 and Y_1 represent hydrogen, halogen atoms, alkyl, alkoxy, alkoxycarbonyl, alkylsulphonyl or alkylcarbamoyl groups of 1 to 6 carbon atoms, nitro, or carbamoyl, or the radicals X_1 and Y_1 form a fused benzene ring, X represents a hydrogen atom, Y represents a halogen atom and Z represents a nitro group or a group of the formula R_1Y_2—, wherein R_1 represents a hydrogen atom, an alkyl or cycloalkyl group of 1 to 6 carbon atoms, naphthyl, phenyl, p-chlorophenyl, and Y_2 represents an oxygen or a sulphur atom, m is 0 to 4, n is 0 to 4, p is 0 to 3, and the sum of $m+n+p$ must be 4, and wherein the atomic ratio of M_1:M_2 is between 5:95 and 95:5 prepared by metallizing an isoindolinone of the formula



wherein R, X, Y, Z, X_1, Y_1, Z_1, m, n and p are as defined above, with a mixture which consists of 5–95 molar percent of a salt selected from the group consisting of a formate, acetate or stearate of zinc, cadmium, lead or manganese and of 95–5 molar percent of a salt of cobalt, copper or nickel.

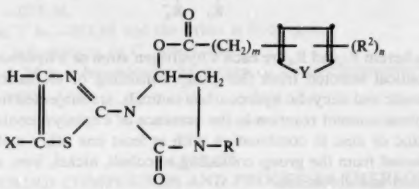
4,097,485

THIAZOLYLIMIDAZOLIDINONE ESTERS OF FURYL AND THIENYL SUBSTITUTED ACIDS

John Krenzer, Oak Park, and Chin Ching Wu, Libertyville, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jun. 17, 1976, Ser. No. 697,294
Int. Cl.² C07D *285/12*
U.S. Cl. 260—306.8 D **9 Claims**

1. A compound of the formula



wherein X is selected from the group consisting of chlorine, bromine, fluorine, and lower alkylsulfonyl; R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and propargyl; m is an integer from 0 to 3; Y is selected from the group consisting of oxygen and sulfur; R^2 is selected from the group consisting of lower alkyl, chlorine, bromine, fluorine; and n is an integer from 0 to 2.

4,097,486

HERBICIDAL THIADIAZOLYLIMIDAZOLIDINONE ESTER

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Oct. 29, 1976, Ser. No. 736,913
The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.
Int. Cl.² C07D *285/12*
U.S. Cl. 260—306.8 D **1 Claim**

1. The compound 1-(5-trifluoromethyl-1,3,4-thiadiazol-2-yl)-3,4-dimethyl-5-acetyloxy-1,3-imidazolin-2-one.

4,097,487
PYRROLIDINYL AND PIPERIDINYL BENZAMIDE DERIVATIVES

Masuo Murakami; Kozo Takahashi, both of Tokyo; Yasufumi Hirata, Ageo; Mutsuo Takashima, Kawagoe; Sumio Iwanami, Ageo; Osamu Hasegawa, Kamifukuoka; Yoshihisa Nozaki, Tokyo; Shiro Tachikawa, Omiya; Masaaki Takeda, Urawa, and Shinji Usuda, Matsudo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

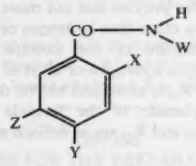
Filed Mar. 29, 1976, Ser. No. 671,583

Claims priority, application Japan, Apr. 2, 1975, 50-39957; Dec. 17, 1975, 50-150948; Dec. 29, 1975, 51-156396; Dec. 27, 1975, 51-157835; Dec. 27, 1975, 51-157834; Dec. 29, 1975, 51-156394

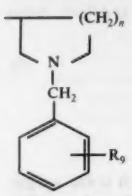
Int. Cl.[2] C07D *207/16, 211/60*

U.S. Cl. 260—326.85 **13 Claims**

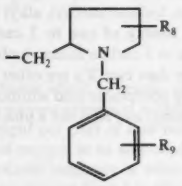
1. A benzamide compound represented by the formula:



wherein X represents a lower alkoxy group; Y represents a hydrogen atom, an amino group, or a mono- or di-lower alkyl amino group; Z represents a halogen atom, a lower alkylthio group, a lower alkylsulfinyl group, a lower alkylsulfonyl group, a sulfamoyl group, or a lower alkylsulfamoyl group; and W represents a 1-ethyl-5-phenyl-2-pyrrolidinylmethyl group, a 2-(2-phenyl-pyrrolidino) ethyl group or a group shown by the formulae:



and



R_8 represents a lower alkyl group; R_9 represents a hydrogen atom, a halogen atom, or a lower alkoxy group; and *n* represents 1 or 2, and the pharmaceutically acceptable nontoxic salts thereof.

4,097,488
N-(3-FLUORANTHYL)MALEIMIDE; A FLUORESCENT REAGENT FOR THE STUDIES OF THIOL COMPOUNDS

Yuichi Kanaoka, Sapporo, Japan, assignor to Teika Seiyaku Kabushiki Kaisha, Toyama, Japan

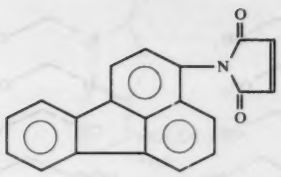
Filed Feb. 24, 1977, Ser. No. 771,634

Claims priority, application Japan, Apr. 6, 1976, 51-38485

Int. Cl.[2] C07D *207/30*

U.S. Cl. 260—326.5 C **1 Claim**

1. A compound of the formula:



4,097,489
9-DEOXY-9α,6-NITRILO OR 6,9α-IMINO-PGF COMPOUNDS

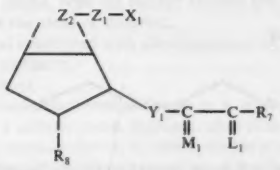
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 17, 1977, Ser. No. 807,514

Int. Cl.[2] C07D *209/52*

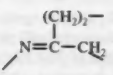
U.S. Cl. 260—326.27 **52 Claims**

1. A prostacyclin analog of the formula

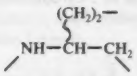


wherein

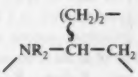
Z_2 is



(1)



(2)



(3)

wherein

R_2 is alkyl of one to 4 carbon atoms, inclusive, or alkylcarbonyl of one to 4 carbon atoms, inclusive;

wherein Z_1 is

(1) $-(CH_2)_g-CH_2-CH_2-$,

(2) $-(CH_2)_g-CH_2-CF_2-$, or

(3) trans$-(CH_2)_g-CH=CH-$,

wherein

g is the integer zero, one, or 2;

wherein

R_8 is hydrogen, hydroxy, or hydroxymethyl;

wherein

Y_1 is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) $-CH_2CH_2-$,

(4) trans—CH=C(Hal)—, or

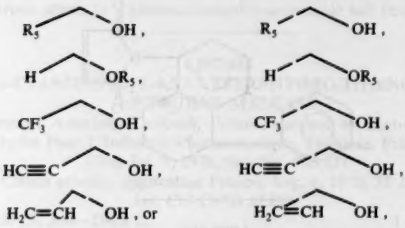
(5) —C≡C—

wherein

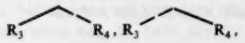
Hal is chloro or bromo;

wherein

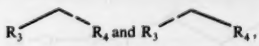
M_1 is



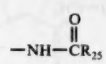
wherein
R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive.
wherein
L_1 is



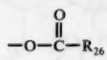
or a mixture of



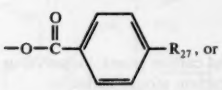
wherein
R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein
X_1 is
(1) $—COOR_1$ wherein R_1 is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted witth one, two, or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by



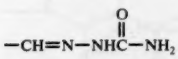
(a)



(b)



(c)



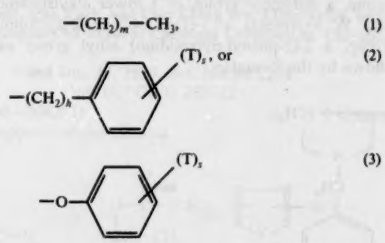
(d)

wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $—NH_2$; R_{26} is methyl, phenyl, $—NH_2$, or methoxy; and R_{27} is hydrogen or acetamido, inclusive; or a pharmacologically acceptable cation;
(2) $—CH_2OH$; or
(3) $—COL_4$, wherein L_4 is
(a) amido of the formula $—NR_{21}R_{22}$, wherein R_{21} and R_{22} are
(i) hydrogen;
(ii) alkyl of one to 12 carbon atoms, inclusive;
(iii) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(iv) aralkyl of 7 to 12 carbon atoms, inclusive;
(v) phenyl;
(vi) phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(vii) carboxyalkyl of one to 4 carbon atoms, inclusive;
(viii) carbamoylalkyl of one to 4 carbon atoms, inclusive;
(ix) cyanoalkyl of one to 4 carbon atoms, inclusive;
(x) acetylalkyl of one to 4 carbon atoms, inclusive;
(xi) benzoylalkyl of one to 4 carbon atoms, inclusive;
(xii) benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(xvii) hydroxyalkyl of one to 4 carbon atoms, inclusive;
(xviii) dihydroxyalkyl of one to 4 carbon atoms; or
(xix) trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl;
(b) carbonylamido of the formula $—NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above; or
(c) sulphonylamido of the formula $—NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined above;

or

(d) hydrazino of the formula $—NR_{23}R_{24}$, wherein R_{24} is amido of the formula $—NR_{21}R_{22}$, as defined above;

wherein
R_7 is
(1) $—(CH_2)_m—CH_3$,



(1)
(2)
(3)

wherein *m* is the integer one to 5, inclusive, *h* is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, or with the proviso that not more than two T's are other than alkyl; and the pharmacologically acceptable acid addition salts thereof when R_2 is not alkylcarbonyl and R_1 is not a pharmacologically acceptable cation.

4,097,490

PYROGLUTAMIC ACID SALTS OF t-BUTYLAMINO-2,3-DIHYDROXYPROPANE

Donald F. Reinhold, North Plainfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 615,941, Sep. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 532,547, Dec. 13, 1974, abandoned. This application Feb. 9, 1977, Ser. No. 767,183
Int. Cl.[2] C07D *207/28*
U.S. Cl. 260—326.45 **2 Claims**

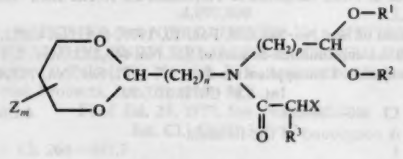
1. R-pyroglutamic acid.R-1-t-butylamino-2,3-dihydroxypropane.

4,097,491
N-DIALKOXYALKYL-N-DIOXANALKYLENE-α-HALOALKANAMIDES

Roger D. Hotz, Evanston; Leonard J. Stach, Riverside, both of Ill., and Sidney B. Richter, Barberton, Ohio, assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jun. 10, 1977, Ser. No. 805,254
Int. Cl.[2] C07D *319/04;* A01N *9/24*
U.S. Cl. 260—340.7 9 Claims

1. A compound of the formula



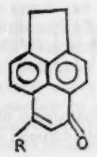
wherein Z is lower alkyl; *m* is an integer from 0 to 4; *n* and *p* are each integers from 1 to 2; R^1 and R^2 are each lower alkyl; R^3 is hydrogen or lower alkyl; and X is halogen.

4,097,492
PROCESS FOR THE PREPARATION OF NAPHTHALENE-1,4,5,8-TETRACARBOXYLIC ACID

Freimund Rohrscheid, Kelkheim, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 501,665, Aug. 29, 1974, abandoned. This application May 4, 1976, Ser. No. 683,039
Claims priority, application Germany, Aug. 31, 1973, 2343964
Int. Cl.[2] C07D *311/02;* C07C *51/33*
U.S. Cl. 260—345.2 31 Claims

1. A process for the preparation of a mixture of naphthalene-1,4,5,8-tetracarboxylic acid and its anhydrides, which comprises oxidizing a peri-acenaphthindenone of the formula



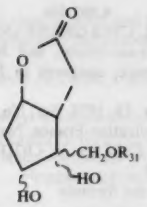
where R is hydrogen or lower alkyl, in acetic, formic, proprionic, or butyric acid as a solvent present in a concentration of about 1 to 10 parts by weight per part of said indenone, with nitric acid in the absence of oxygen in an amount from about 7 to about 14 mols per mol of said indenone or with nitric acid in the presence of oxygen in an amount from 1 to about 6 mols per mol of said indenone, in the presence of an oxidation catalyst, said catalyst being present in an effective amount having a concentration on the order of about 0.2 to 40 mg-atom/1 of said solvent at a temperature from above about 100° C to about 240° C, and isolating the reaction product obtained.

4,097,493
2,3,5α-TRIHYDROXY-2-HYDROXYMETHYL-1α-CYCLOPENTANE ACETIC ACID 5γ -LACTONE DERIVATIVES

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,893, Apr. 14, 1976, Pat. No. 4,048,194. This application May 12, 1977, Ser. No. 796,098
Int. Cl.[2] C07D *307/77*
U.S. Cl. 260—343.3 P 2 Claims

1. A thromboxane intermediate of the formula



wherein R_{31} is a hydroxy-hydrogen replacing group selected from the group consisting of R_9, R_{10}, and R_{34};
wherein R_9 is an acyl protecting group selected from the group consisting of
(a) benzoyl;
(b) benzoyl substituted with one to 5 alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 12 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents are other than alkyl, and that the total number of carbon atoms in the substituents does not exceed 10 carbon atoms, with the further proviso that the substituents are the same or different.
(c) benzoyl substituted with alkoxycarbonyl of 2 to 5 carbon atoms, inclusive;
(d) naphthoyl;
(e) naphthoyl substituted with one to 9, inclusive, alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 10 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents on either of the fused aromatic rings are other than alkyl and that the total number of carbon atoms in the substituents on either of the fused aromatic rings does not exceed 10 carbon atoms, with the further proviso that the various substituents are the same or different; and
(f) alkanoyl of 2 to 12 carbon atoms, inclusive;
wherein R_{10} is a blocking group selected from the group consisting of
(a) tetrahydropyranyl;
(b) tetrahydrofuranyl; and
(c) a group of the formula

$$-C(OR_{11})(R_{12})-CH(R_{13})(R_{14}),$$

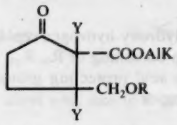
wherein R_{11} is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with one to 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_{12} and R_{13} are alkyl of one to 4 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, or when R_{12} and R_{13} are taken together $-(CH_2)_a-$ or $-(CH_2)_b-O-(CH_2)_c$, wherein *a* is 3, 4, or 5, or *b* is one, 2, or 3, and *c* is one, 2, or 3, with the proviso that *b* plus *c* is 2, 3, or 4, with the further proviso that R_{12} and R_{13} may be the same or different, and wherein R_{14} is hydrogen or phenyl;
wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of
(a) benzyl,
(b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive, with the further proviso that the various substituents are the same or different,
(c) benzhydryl,
(d) benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,
(e) trityl, and
(f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive.

4,097,494
NOVEL CYCLOPENTANONES

Jean Buendia, Nogent-sur-Marne, and Jeanine Schalbar, Suresnes, both of France, assignors to Roussel Uclaf, Paris, France

Filed Nov. 19, 1976, Ser. No. 743,507
Claims priority, application France, Nov. 26, 1975, 75 36161
Int. Cl.[2] C07C *69/74;* C07D *309/12*
U.S. Cl. 260—345.8 P 3 Claims

1. A compound of the formula



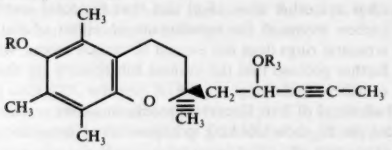
wherein AlK is alkyl of 1 to 4 carbon atoms, R is selected from the group consisting of hydrogen and α-tetrahydropyranyl and Ys are hydrogen.

4,097,495
TETRAMETHYL-BENZYLOXY CHROMANS

Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 638,382, Dec. 8, 1975, Pat. No. 4,029,678, which is a continuation-in-part of Ser. No. 544,153, Jan. 27, 1975, Pat. No. 4,000,169. This application Feb. 22, 1977, Ser. No. 770,540
Int. Cl.[2] C07D *311/72*
U.S. Cl. 260—345.5 1 Claim

1. A compound of the formula:



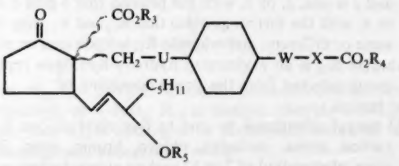
wherein R is benzyl, benzhydryl or trityl; and R_3 is 3,5-dinitrobenzoyl, p-nitrobenzoyl or benzoyl.

4,097,496
NOVEL CYCLOPENTANE DERIVATIVES

Milos Babej, Frankfurt am Main; Wilhelm Bartmann, Neuenhain, Taunus; Gerhard Beck, Frankfurt am Main, and Ulrich Lerch, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 480,319, Jun. 17, 1974, Pat. No. 3,984,459. This application Jun. 23, 1976, Ser. No. 698,842
Claims priority, application Germany, Jun. 19, 1973, 2331081
Int. Cl.[2] C07G *177/00*
U.S. Cl. 260—345.8 P 8 Claims

1. A cyclopentane compound of the formula



wherein R_3 is alkyl of 1 to 5 carbon atoms; R_4 is hydrogen, alkyl of 1 to 5 carbon atoms, or a physiologically tolerable monovalent or polyvalent cation; R_5 is cycloalkyl of 5 to 8 carbon atoms wherein the $—CH_2—$ group in the 2-position is replaced by oxygen; U is $-(CH_2)_m-$ where m is an integer from 0 to 5; W is a simple bond or

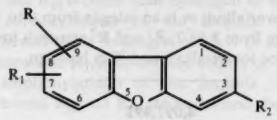
where R_8 and R_9 are the same or different and are hydrogen or alkyl of 1 to 5 carbon atoms; and X is $-(CH_2)_n-$ wherein n is an integer from 0 to 5.

4,097,497
AMIDES OF 2-(3-DIBENZOFURAN) ALKANOIC ACIDS

Leo Berger, Montclair, and Robert August Schmidt, Wallington, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 548,658, Feb. 10, 1975, Pat. No. 4,022,805, which is a continuation-in-part of Ser. No. 448,853, Mar. 7, 1974, abandoned. This application Jan. 27, 1977, Ser. No. 763,446
Int. Cl.[2] C07D *307/91*
U.S. Cl. 260—346.71 4 Claims

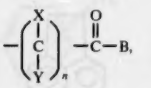
1. A compound of the formula



I

wherein R is hydrogen, halogen, hydroxy, cyano, lower alkyl, hydroxy-lower alkyl, lower alkoxy, alkanoyl of 1–7 carbon atoms, benzoyl, benzyloxy, lower alkylthio, trifluoromethyl, carbo-lower alkoxy, nitro, amino, mono-lower alkylamino, di-lower alkylamino, sulfamoyl, di-lower alkylsulfamoyl or difluoromethylsulfonyl; R_1 is halogen, cyano, lower alkyl, hydroxy-lower alkyl, lower alkoxy, alkanoyl of 1–7 carbon atoms, benzoyl, acetamido, benzyloxy, lower alkylthio, trifluoromethyl, hydroxy, carbo-lower alkoxy, nitro, amino, mono-lower alkylamino, di-lower alkylamino, sulfamoyl, di-lower alkylsulfamoyl or difluoromethylsulfonyl;

R_2 is



wherein B is amino, hydroxyamino, mono-lower alkylamino or di-lower alkylamino; Y is hydrogen and X is lower alkyl; and n is 1;

its enantiomers; or when R or R_1 is amino, mono-lower alkylamino or di-lower alkylamino, an addition salt thereof with a pharmaceutically acceptable acid.

4,097,498
PROCESS FOR PREPARING MALEIC ANHYDRIDE FROM C_4 HYDROCARBONS

Bruno J. Barone, and Ralph O. Kerr, both of Houston, Tex., assignors to Denka Chemical Corporation, Houston, Tex.

Division of Ser. No. 558,738, Mar. 17, 1975, Pat. No. 4,018,709. This application Sep. 20, 1976, Ser. No. 724,558
Int. Cl.[2] C07D *307/89*
U.S. Cl. 260—346.75 8 Claims

1. A process for the production of maleic anhydride comprising contacting feed of normal C_4 hydrocarbons in vapor phase at elevated temperatures in the range of 375° to 550° C with oxygen and a catalyst complex consisting essentially of principal active components in the atom ratios vanadium 1: phosphorus 0.90 to 1.3 Me0.005 to 0.4 wherein Me is a mixture of B and elements selected from the group consisting of Zn, Cr, U, W, Cd, Ni and Si and mixtures thereof.

4,097,499

1-[5-(4-CHLOROPHENYL)FURFURYLAMINO]-2-PROPANOL HYDROCHLORIDE

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,548
Int. Cl.[2] C07D *307/52*
U.S. Cl. 260—347.7 1 Claim

1. The compound 1-[5-(4-chlorophenyl)furfurylamino]-2-propanol hydrochloride.

4,097,500

N-METHYL-5-(4-NITROPHENYL)-N-(A-METHYL-PHENETHYL)FURFURYLAMINE HYDROCHLORIDE

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,527
Int. Cl.[2] C07D *307/52*
U.S. Cl. 260—347.7 1 Claim

1. The compound N-methyl-5-(4-nitrophenyl)-N-(a-methylphenethyl)-furfurylamine hydrochloride.

4,097,501

USE OF COATED CATALYSTS IN THE PREPARATION OF MALEIC ANHYDRIDE

Serge R. Dolhyj, Parma; Ernest C. Milberger, Solon, and Sandra R. Evans, Cleveland, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 19, 1976, Ser. No. 687,827
Int. Cl.[2] C07D *307/60*
U.S. Cl. 260—346.74 9 Claims

1. In a process for the preparation of maleic anhydride by the reaction of benzene with air, and optionally steam, in the presence of an oxide catalyst which is useful in a fixed-bed reactor, the improvement comprising:

using a catalyst consisting of

(a) an essentially inert, at least partially porous support having a particle size of at least 20 microns, wherein said support has an outer surface, said support being selected from the group consisting of silica, alumina, silicon carbide, alumina-silica, titania and zirconia; and

(b) a coating consisting essentially of a catalytically active oxide material on said outer surface of said support which strongly adheres to said outer surface of said support, wherein said catalytically active oxide material contains at least an oxide of vanadium or an oxide of molybdenum, and wherein said catalyst is prepared by (1) contacting the support with a liquid to produce a partially wet support, said partially wet support being one that does not have the appearance of having liquid on the outer surface of said support; and (2) contacting said partially wet support with a powder of a catalytically active material to produce a support having a strongly adherent coating of said catalytically active material on the outer surface of said support.

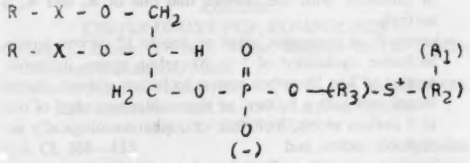
4,097,502

PHOSPHATIDYL SULFONIUM HYDROXIDE COMPOUNDS

Barry D. Sears, 43 Bay State Rd., Marblehead, Mass. 02215

Continuation-in-part of Ser. No. 731,132, Oct. 12, 1976. This application Feb. 22, 1977, Ser. No. 770,407
Int. Cl.[2] C08H *3/00*
U.S. Cl. 260—399 10 Claims

1. Synthetic phosphatidyl sulfonium [hydroxide] compounds represented by the formula:



wherein X is an acyl group (C=O) [or a carbon atom (C)]; R is a hydrocarbon radical; R_1 and R_2 are selected from the group of alkyl, alkylene, phenyl and benzyl radicals; and R_3 is a [C_1–C_{10} hydrocarbon] methyulene radical of from 1 to 10 carbon atoms.

10. The compounds of claim 1 selected from the group consisting of:

dioleoyl phosphatidyl-(methylethylene-S-diethyl)sulfonium;
dipalmitoyl phosphatidyl-(ethylene-S-dimethyl)sulfonium;
distearoyl phosphatidyl-(ethylene-S-diethyl)sulfonium;
oleoyl-palmitoyl phosphatidyl-(ethylene-S-dimethyl)-sulfonium;
dimyristoyl phosphatidyl-(tetramethylene-S-dipropylmethyl)sulfonium;
dipalmitoyl phosphatidyl-(trimethylene-S-dimethyl)sulfonium;
egg phosphatidyl-(trimethylene-S-dimethyl)sulfonium;
soybean phosphatidyl-(trimethylene-S-dimethyl)sulfonium; and
dipalmitoyl phosphatidyl-(tetramethylene-S-dimethyl)-sulfonium.

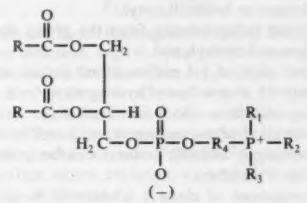
4,097,503

PHOSPHATIDYL PHOSPHONIUM HYDROXIDE COMPOUNDS

Barry D. Sears, 43 Bay State Road, Boston, Mass. 02215

Continuation-in-part of Ser. No. 731,132, Oct. 12, 1976. This application Feb. 22, 1977, Ser. No. 770,290
Int. Cl.[2] C08H *3/00*
U.S. Cl. 260—403 10 Claims

1. Synthetic phosphatidyl quaternary phosphonium compounds represented by the formula:



wherein R is a long-chain hydrocarbon radical; R_1, R_2 and R_3 are C_1–C_4 alkyl radicals, phenyl radicals or benzyl radicals; R_4 is a methylene radical of from 1 to 10 carbon atoms, except where R_4 is dimethylene and R_1, R_2 and R_3 are methyl radicals.

5. The compound of claim 1 selected from the group consisting of:

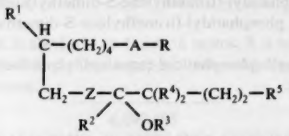
dioleoyl phosphatidyl-(methylethylene-P-triethyl)phosphonium;
dipalmitoyl phosphatidyl-(ethylene-P-dimethylethyl)phosphonium;
distearoyl phosphatidyl-(ethylene-P-dimethylethyl)phosphonium;
oleoyl-palmitoyl phosphatidyl-(ethylene-P-dimethylethyl)-phosphonium;
dimyristoyl phosphatidyl-(tetramethylene-P-dipropylmethyl)phosphonium;
dipalmitoyl phosphatidyl-(trimethylene-P-trimethyl)phosphonium;
egg phosphatidyl-(trimethylene-P-trimethyl)phosphonium;
soybean phosphatidyl-(trimethylene-P-trimethyl)phosphonium; and
dipalmitoyl phosphatidyl-(tetramethylene-P-trimethyl)-phosphonium.

4,097,504
11,12-SECOPROSTAGLANDINS

Edward J. Cragoe, Jr.; John B. Bicking, and Robert L. Smith, all of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 669,118, Mar. 22, 1976, Pat. No. 4,066,692, which is a continuation-in-part of Ser. No. 571,038, Apr. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 389,901, Aug. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 302,365, Oct. 30, 1972, abandoned. This application Dec. 17, 1976, Ser. No. 751,501
Int. Cl.[2] C09F *5/00;* C11C *3/00*
U.S. Cl. 260—405 9 Claims

1. The compound having the following formula:



wherein R is carboxy, a carboxy salt having the formula $-COO^-Me^+$ wherein Me is a pharmaceutically acceptable cation derived from a metal or an amine, or derivatized carboxy having the formula -COOY wherein Y is alkyl having 1-10 carbon atoms, 1-succinimidoethyl, 1-(pivaloyloxy)ethyl, 2-acetamidoethyl, or diloweralkylamino-loweralkyl;

A is ethylene, trimethylene, α-methylethylene, β-methylethylene, α,α-dimethylethylene, or β,β-dimethylethylene;

R^1 is formyl, acetyl, propionyl, acryloyl, hydroxyacetyl, 3-hydroxypropionyl, hydroxymethyl, 1-hydroxyethyl, 1,2-dihydroxyethyl, 1,3-dihydroxypropyl, or 1-hydroxy-1-methylethyl;

Z is methylene, ethylene, trimethylene, tetramethylene, vinylene, or ethynylene;

R^2 is independently hydrogen or methyl;

R^3 is hydrogen or loweralkanoyl;

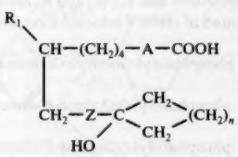
R^4 is selected independently from the group consisting of hydrogen and methyl; and

R^5 is lower alkyl of 1-4 carbon atoms joined with the R^2 methyl (with abstraction of hydrogen) to form a carbocyclic ring with from 6 to 9 members; or

R^5 is lower alkyl of 1-4 carbon atoms joined to the carbon atom bearing R^2 and OR^3 to form a carbocyclic ring with from 5 to 8 members.

2. The compound of claim 1 wherein R is carboxy or a pharmaceutically acceptable carboxy salt.

3. The compound of claim 2 which has the formula:



wherein R^1 is formyl, acetyl, propionyl, hydroxyacetyl, hydroxymethyl, 1-hydroxyethyl, or 1-hydroxy-1-methylethyl; A is ethylene, trimethylene, α-methylethylene, β-methylethylene,α,α-dimethylethylene, or β,β-dimethylethylene, Z is methylene, ethylene, trimethylene, vinylene or ethynylene, and *n* is an integer of 2 to 6.

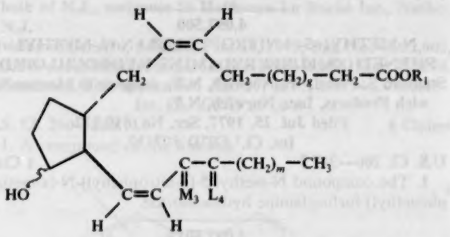
4. 8-Acetyl-11-(1-hydroxycyclohexyl)undecanoic acid, the compound of claim 3 wherein A and Z are ethylene, R^1 is acetyl, and *n* is 3.

4,097,505
CIS-13-9-DEOXY-PGF$_2$ ANALOGS

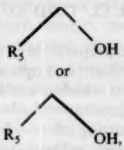
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,243, Sep. 17, 1975, Pat. No. 4,033,989. This application Apr. 11, 1977, Ser. No. 786,701
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—413 27 Claims

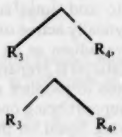
1. A prostaglandin analog of the formula



wherein *m* is one to 5, inclusive;
wherein M_3 is

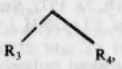


wherein R_5 and R_6 ae hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_4 is



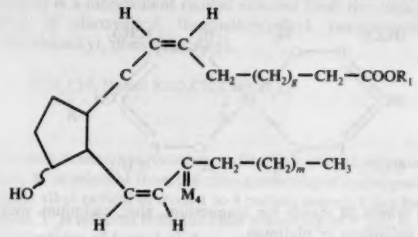
or a mixture of

and

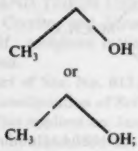


wherein R_3 and R_4 are hydrogen or methyl, being the same or different, with the proviso that one of R_3 and R_4 is methyl;
wherein R_1 is hydrogen, alkyl or one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and
wherein *g* is one, 2, or 3.

10. A prostaglandin analog of the formula

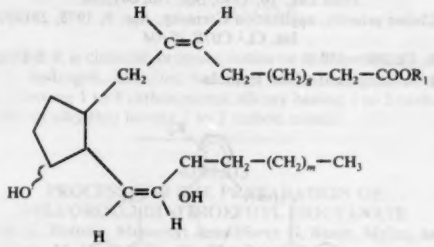


wherein *m* is one to 5, inclusive;
wherein M_4 is



wherein R_1 is hydrogen, alkyl or one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharamacologically acceptable cation; and wherein *g* is one, 2, or 3.

19. A prostaglandin analog of the formula



wherein m is one to 5, inclusive;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and
wherein g is one, 2, or 3.

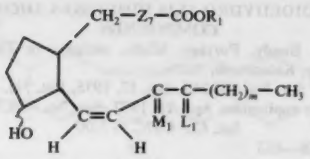
4,097,506

CIS-13,9-DEOXY-PGF$_1$ COMPOUNDS

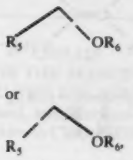
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,243, Sep. 17, 1975, Pat. No. 4,033,989. This application Apr. 11, 1977, Ser. No. 786,700
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—413 **9 Claims**

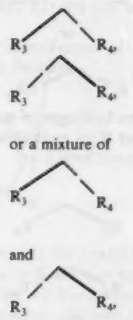
1. A prostaglandin analog of the formula



wherein
m is one to 5, inclusive;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and
wherein Z_7 is:
(1) $-(CH_2)_3-(CH_2)_g-CF_2-$ or
(2) $-(CH_2)_3-(CH_2)_g-CH_2-$,
wherein *g* is one, 2, or 3.

4,097,507

PROCESS FOR SEPARATING STRAIGHT AND BRANCHED CHAIN SOAPS AND THEIR ACIDS

Lucien Person, Levallois Perret, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Dec. 28, 1976, Ser. No. 754,964
Claims priority, application France, Jan. 13, 1976, 76 00680
Int. Cl.[2] C11C *1/00*
U.S. Cl. 260—413 **8 Claims**

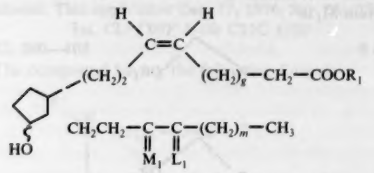
1. A process for separating straight and branched chain soaps comprising adding to a solution thereof a water-soluble lithium compound selected from a hydroxide, halide, sulfate, nitrate, and organic acid salt in at least an amount stoichiometrically sufficient to convert the straight chain soaps into the corresponding lithium salts, separating said lithium salts as a precipitate from said solution, acidifying said salts to recover straight chain organic acids and a lithium salt, and recovering branched chain organic acids from said solution.

4,097,508
CIS-4,5-DIDEHYDRO-13,14 DIHYDRO-9, DIOXY PGF COMPOUNDS

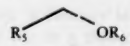
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,243, Sep. 17, 1975, Pat. No. 4,033,989. This application Apr. 11, 1977, Ser. No. 786,714
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—413 12 Claims

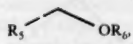
1. A prostaglandin analog of the formula



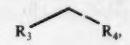
wherein *m* is one to 5, inclusive;
wherein M_1 is



or



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and
wherein *g* is one, 2, or 3.

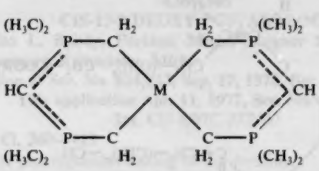
4,097,509
DOUBLE-YLIDE METAL COMPLEXES

Hubert Schmidbaur, Garching, and Oswald Gasser, Munich, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 22, 1977, Ser. No. 780,130
Claims priority, application Germany, Mar. 25, 1976, 2612644; Jan. 21, 1977, 2702326
Int. Cl.[2] C07F *1/12*
U.S. Cl. 260—430 3 Claims

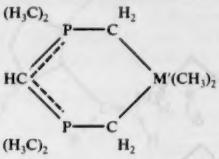
1. Bis-methyl-gold-bis-trimethylphosphano-methane of the formula: $[(CH_3)_3P]_2C(AuCH_3)_2$.

2. A double-ylide metal complex of the formula



in which M stands for magnesium, zinc, cadmium, nickel, palladium or platinum.

3. A double-ylide metal complex of the formula:



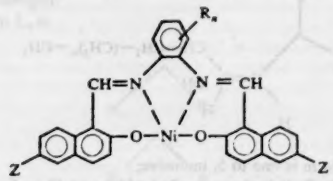
in which M′ stands for boron, aluminum, gallium, indium, thallium or gold.

4,097,510
WATER-INSOLUBLE NICKEL-COMPLEX DISAZO METHINE COMPOUNDS

Theodor Papenfuhs, Frankfurt am Main, and Heinrich Volk, Bad Vilbel, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 16, 1975, Ser. No. 641,252
Claims priority, application Germany, Apr. 9, 1975, 2515523
Int. Cl.[2] C07F *15/04*
U.S. Cl. 260—439 R 1 Claim

1. A compound of the formula



wherein each R, which is the same or different, is halogen, lower alkyl, lower alkoxy, phenoxy, phenoxy substituted by 1 or 2 substituents selected from the group consisting of halogen, lower alkyl and lower alkoxy, hydroxy, cyano, trifluoromethyl, carboxy, carboxylic acid lower alkyl ester, lower alkanoyl, benzoyl or benzoyl substituted by 1 or 2 substituents selected from the group consisting of halogen, lower alkyl and lower alkoxy, *n* is 1, 2 or 3 and Z is hydrogen, halogen, lower alkoxy, nitro or cyano.

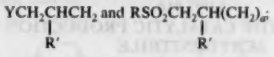
4,097,511
ORGANOFUNCTIONAL-SILICON MATERIALS

Abe Berger, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 691,928, Dec. 20, 1967. This application Jul. 18, 1969, Ser. No. 843,214
Int. Cl.[2] C07F *7/08, 7/10, 7/12*
U.S. Cl. 260—448.2 N 4 Claims

1. Organofunctional-silicon hydrides having the formula:

where Q is a monovalent radical selected from the class consisting of alkoxyalkyl, fluoroalkoxyalkyl, isocyanatoalkyl, methylthioalkyl, phenylthioalkyl,



R is a monovalent hydrocarbon radical free of aliphatic unsaturation; R′ is selected from the class consisting of hydrogen and a lower alkyl radical of from 1 to 4 carbon atoms; Y is a halide radical; Y′ is selected from the class consisting of Y and R; and *a* is an integer of from 1 to 5.

4,097,512

N-TETRACHLOROFLUOROETHYLTHIO-HALO-BENZOYL ANILIDES AND THEIR USE AS FUNGICIDES

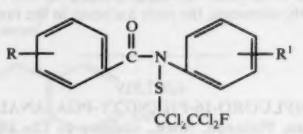
Hsiao-Ling Lam, El Cerrito, and Ferenc M. Pallos, Walnut Creek, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 613,642, Sep. 15, 1975, abandoned, which is a continuation of Ser. No. 537,240, Dec. 30, 1974, abandoned. This application Jan. 31, 1977, Ser. No. 764,258

Int. Cl.[2] **C07C** *69/00;* **A01N** *9/12*

U.S. Cl. 260—453RW **2 Claims**

1. A compound of the formula



in which R is chlorine, bromine, iodine or trifluoromethyl and R^1 is hydrogen, chlorine, bromine, iodine, trifluoromethyl, alkyl having 1 to 5 carbon atoms, alkoxy having 1 to 2 carbon atoms or alkylthio having 1 to 2 carbon atoms.

4,097,513

PROCESS FOR THE PREPARATION OF 2-FLUORO-2,2-DINITROETHYL ISOCYANATE

Alain G. Becuwe, Mennecy; Jean-Pierre G. Senet, Melun, and Claude M. Ucciani, Vert le Petit, all of France, assignors to Societe Nationale des Poudres et Explosifs, France

Filed Dec. 13, 1976, Ser. No. 749,892

Claims priority, application France, Dec. 23, 1975, 75 39426

Int. Cl.[2] **C07C** *118/02, 119/042*

U.S. Cl. 260—453 PH **6 Claims**

1. A process for the preparation of a solution of 2-fluoro-2,2-dinitroethyl isocyanate which comprises reacting phosgene with 2-fluoro-2,2-dinitro-ethylamine in solution in the absence of an added acid acceptor at a temperature of −15° - +5° C to obtain 2-fluoro-2,2-dinitro-carbamyl chloride in the first step and then decomposing said carbamyl chloride in a second step in the absence of an added acid acceptor at a temperature between 20° and 50° C while passing through the solution a stream of an inert anhydrous gas.

4,097,514

PROSTAGLANDIN DERIVATIVES

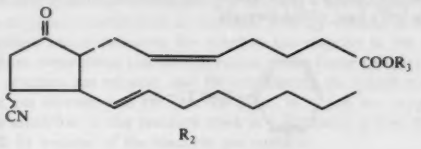
Donald P. Strike, St. Davids, and Wen-Ling Kao, Devon, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 384,769, Aug. 1, 1973, Pat. No. 3,845,042, which is a continuation-in-part of Ser. No. 282,200, Aug. 21, 1972, abandoned. This application Aug. 2, 1974, Ser. No. 494,151

Int. Cl.[2] **C07C** *121/46, 121/48*

U.S. Cl. 260—464 **2 Claims**

1. A compound of the formula:



wherein R_2 is hydrogen, acetoxy and tetrahydropyranyloxy and R_3 is hydrogen or lower alkyl.

4,097,515

PROCESS FOR THE MANUFACTURE OF CYANO-SUBSTITUTED STILBENE COMPOUNDS

Adolf Emil Siegrist, Basel, and Vincenzo Coviello, Marly, both of Switzerland, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

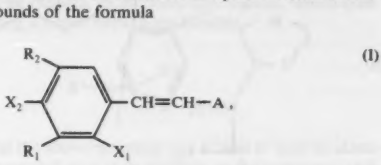
Division of Ser. No. 519,164, Oct. 30, 1974, Pat. No. 4,008,224. This application Sep. 16, 1976, Ser. No. 723,691

Claims priority, application Switzerland, Nov. 19, 1973, 16246/73; Nov. 19, 1973, 16247/73

Int. Cl.[2] **C07C** *121/60, 121/62, 121/75*

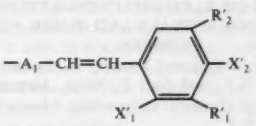
U.S. Cl. 260—465 G **11 Claims**

1. A process for the manufacture of cyano-substituted stilbene compounds of the formula



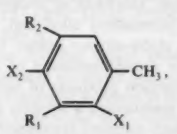
(I)

wherein either X_1 represents the cyano radical and X_2 represents hydrogen, chlorine or fluorine or together with R_1 represents a fused benzene ring, or X_2 represents the cyano radical and X_1 represents hydrogen, chlorine or alkyl with 1 to 4 carbon atoms or together with R_1 represents a fused benzene ring, R_1 represents hydrogen, chlorine, fluorine or alkoxy with 1 to 4 carbon atoms or together with X_1 or X_2 represents a fused benzene ring, R_2 represents hydrogen, chlorine, fluorine or alkoxy with 1 to 4 carbon atoms and A represents a phenyl, naphthyl, biphenyl, or stilben-4-yl radical, which is unsubstituted or substituted by chlorine and/or alkoxy with 1 to 4 carbon atoms or a radical of the formula



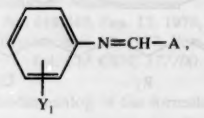
(II)

wherein either X'_1 represents the cyano radical and X'_2 represents hydrogen, chlorine or fluorine or X'_2 represents the cyano radical and X'_1 represents hydrogen, chlorine or alkyl with 1 to 4 carbon atoms, each of R'_1 and R'_2 independently represents hydrogen, chlorine, fluorine or alkoxy with 1 to 4 carbon atoms and A_1 represents 1,4-, 1,5- or 2,6- naphthylene, 1,4-phenylene or 4,4′-bisphenylene which comprises reacting a toluene derivative of the formula



(III)

wherein X_1, X_2, R_1 and R_2 have the meaning given above, with a Schiff's base of the formula



(IV)

wherein Y_1 represents chlorine or hydrogen, preferably in the 2-position, and A has the meaning given above, in dimethyl formamide and in the presence of sodium alcoholate at a temperature of 0 to 40° C.

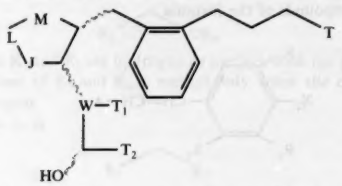
4,097,516

5,6-BENZO ANALOGUES OF PROSTAGLANDIN E

Robert Thomas Buckler, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 671,423, Mar. 29, 1976. This application Apr. 20, 1977, Ser. No. 789,134
Int. Cl.² C07C *177/00*
U.S. Cl. 260—465 F **3 Claims**

1. A compound of the formula,



in which:
T is cyano;
M is carbonyl;
L is methylene;
J is methylene;
W is trans -CH=C-;
T_1 and T_2 are attached to adjacent carbon atoms;
T_1 is hydrogen only if T_2 is loweralkyl; and
T_2 is loweralkyl having 1-5 carbon atoms.

4,097,517

CLEAVAGE OF ALPHA-OXIMINOKETONES, ALDEHYDES AND ACETALS AND THEIR NITROSO ISOMERS

Milorad M. Rogic, Whippany; Timothy R. Demmin, Morris Plains, both of N.J., and Karl P. Klein, Alexandria, Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Sep. 10, 1976, Ser. No. 722,249
Int. Cl.² C07C *120/00*
U.S. Cl. 260—465.4 **13 Claims**

1. Process for cleavage, in an alpha-oximino-ketone, aldehyde or acetal, or in the monomeric or dimeric alpha-nitroso isomer of such compound, of the bond joining (a) the carbon atom bearing the oxime or nitroso group and (b) the carbonyl carbon atom or dialkoxy substituted carbon atom of an acetal of such carbonyl group, which process comprises: contacting said alpha-oximino ketone, aldehyde or dialkyl acetal having no substituents except permissibly alkyl and chloro, or the monomeric or dimeric alpha-nitroso isomer thereof with at least one reagent of the group consisting of ortho esters of carboxylic acids and reaction products of such ortho esters with Lewis acids — or maintaining a solution of an adduct of such ortho ester with such oximino compound — in an inert liquid electrophilic reaction medium for a time such that the cleavage reaction occurs at the prevailing temperature and pressure with formation of a cyano group and an ester group.

4,097,518

METHOD FOR THE CATALYTIC PRODUCTION OF ACRYLONITRILE

Sumio Umemura; Kyoji Ohdan; Taizo Uda; Tokuo Matsuzaki; Mikio Hidaka; Yasuo Nakamura, and Tsuruoka, Masao, all of Ube, Japan, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Oct. 19, 1976, Ser. No. 733,771
Int. Cl.² C07C *120/14*
U.S. Cl. 260—465.3 **18 Claims**

1. A method for the catalytic production of acrylonitrile by ammoxidation of propylene, comprising bringing at an elevated temperature, a reaction feed containing propylene, ammonia and molecular oxygen in the gas phase into contact with a catalyst consisting essentially of an oxide composition according to the formula:

$$Mo_aCo_bFe_cX_dO_e$$

wherein X represents at least one element selected from the group consisting of calcium, tungsten, chromium, zirconium, titanium, zinc, manganese and tin; the subscripts *a*, *b*, *c*, and *d* respectively represent the atomic ratios a:b:c:d, of the elements in the range of 12:(4 to 10):(1 to 6):(0.1 to 1.0); and the subscript *e* represents the number of oxygen atoms which satisfies the valence of the elements, the ratio a:e being in the range of 12:40 to 70.

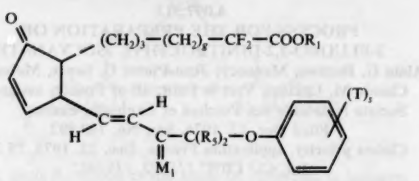
4,097,519

2,2-DIFLUORO-16-PHENOXY-PGA$_1$ ANALOGS

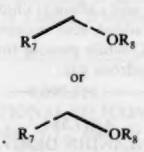
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 552,708, Feb. 25, 1975, Pat. No. 4,001,300. This application Sep. 17, 1976, Ser. No. 724,239
Int. Cl.² C07C *65/22, 177/00*
U.S. Cl. 560—53 **58 Claims**

1. A compound of the formula

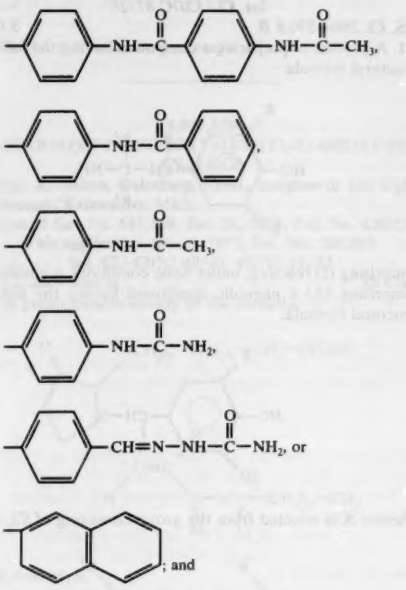


or a mixture comprising that compound and the enantiomer thereof,
wherein *g* is 2 to 4, inclusive;
wherein M_1 is



wherein R_7 and R_8 are hydrogen or methyl, with the proviso that one of R_7 or R_8 is methyl only when the other is hydrogen;
wherein T is alkyl of one to 3 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_4 wherein R_4 is alkyl of one to 3 carbon atoms, inclusive, and wherein *s* is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms,

inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro, alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation,



wherein R_5 is hydrogen or methyl, with the proviso that R_5 is methyl only when R_7 and R_8 are both hydrogen.

4,097,520

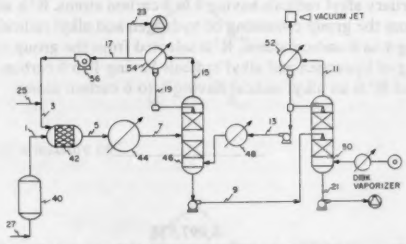
PREPARATION OF PERACETIC ACID BY OXIDATION OF ACETALDEHYDE

Gerald Holmes Slattery, Pasadena, Md., assignor to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 105,527, Jan. 11, 1971. This application Feb. 1, 1974, Ser. No. 438,949

Int. Cl.[2] C07C *179/12*

U.S. Cl. 260—502 A **3 Claims**



1. In the process of producing peracetic acid by the vapor-phase oxidation of acetaldehyde in a reaction zone, in which the reactants, acetaldehyde and oxygen, are mixed before introducing the reaction gas mixture into the reaction zone, which is maintained at a temperature of 100° to 230° C at a pressure of up to 50 pounds per square inch, and recovering the product peracetic acid by absorption in a liquid selected from the group consisting of acetone and ethyl acetate, the improvement which comprises: (a) mixing the reactants in a cylindrical mixer-explosion-suppression chamber containing aluminum or stainless steel packing whose passage diameter is less than the critical diameter of the reaction gas mixture, while maintaining the oxygen concentration at less than 10% by volume in said chamber and maintaining the reaction gas velocity in the explosion suppression chamber in excess of the flame velocity of the reaction gas mixture, and (b) introducing the mixed reaction gas mixture into the reaction zone, in which the oxygen concentration in the reaction zone is maintained at less than 10% by volume of the reaction gas mixture.

4,097,521

MANUFACTURE OF AMIDOSULFONIC ACIDS

Hans Rupert Merkle, Ludwigshafen, and Albrecht Müeller, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

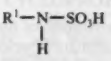
Filed May 13, 1977, Ser. No. 796,548

Claims priority, application Germany, Jun. 23, 1976, 2628195

Int. Cl.[2] C07C *143/86*

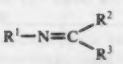
U.S. Cl. 260—513.6 **7 Claims**

1. A process for the manufacture of amidosulfonic acids of the formula



I

where R^1 is an aliphatic or cycloaliphatic radical, which comprises reacting a Schiff base of the formula



II

where R^1 has the above meanings and R^2 and R^3 may be identical or different and each is an aliphatic or cycloaliphatic radical or a furyl radical, and R^2 may also be hydrogen, with sulfur trioxide in a first stage and then reacting the adduct formed in the first stage with water in a second stage.

4,097,522

SYNTHESIS OF M-BENZOYL-HYDRATROPIC ACID

Leandro Baiocchi, Rome, Italy, assignor to Aziende Chimiche Riunite Angelini Francesco A.C.R.A.F. S.p.A., Rome, Italy

Filed May 28, 1976, Ser. No. 690,832

Claims priority, application Italy, Jun. 5, 1975, 49925 A/75

Int. Cl.[2] C07C *65/20*

U.S. Cl. 260—517 **5 Claims**

1. A process for the production of m-benzoyl hydratropic acid which comprises (a) condensing 2-benzoyl cyclohexanone and a compound selected from the group consisting of pyruvic acid and its ester to obtain a reaction mixture containing as a reaction product 7-benzoyl-3-methyl-2,4,5,6-tetrahydro-benzo[b]-furan-2-one, and then (b) heating the reaction mixture at a temperature of 200° to 230° C in the presence of a large excess of an acid catalyst.

4,097,523

LIQUID PHASE OXIDATION OF UNSATURATED ALIPHATIC ALDEHYDES TO UNSATURATED ALIPHATIC ACIDS

Jar-Lin Kao, Cherry Hill, N.J., and John Joseph Leonard, Springfield, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 12, 1977, Ser. No. 758,623

Int. Cl.[2] C07C *51/32, 57/04, 57/06, 57/08*

U.S. Cl. 260—530 N **13 Claims**

1. A process for the liquid phase oxidation of an α,β-unsaturated aliphatic aldehyde containing from 3 to 6 carbon atoms in an inert solvent solution to the corresponding unsaturated aliphatic carboxylic acid which comprises contacting said aldehyde with oxygen or an oxygen-containing gas at a

temperature of from about 0° C. to 100° C. and a pressure between about atmospheric and 1500 psig in the presence of from about 0.00001 to 0.5 mole of a thallium compound or mixture of thallium compounds selected from the group consisting of thallium triacetate, thallous acetate, thallium trihexanoate, thallium tripropionate, thallium acetylacetonate, thallic bromide, thallic chloride, thallic nitrate, thallic sulfate, thallic oxide, thallous iodide, thallous hydroxide, thallous chloride, thallous bromide, thallous carbonate, thallous sulfate, thallous nitrate and thallous perchlorate, per mole of said aldehyde to effect an in situ decomposition of intermediate peroxide compounds formed during the oxidation to said unsaturated aliphatic carboxylic acid.

4,097,524

PROCESS FOR THE PREPARATION OF FORMAMIDES

Haven Sylvester Kesling, Jr., Drexel Hill, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 27, 1976, Ser. No. 754,151
Int. Cl.[2] C07C *103/02*
U.S. Cl. 260—561 R **15 Claims**

1. A process for the preparation of formamides which comprises reacting a tertiary aliphatic, cycloaliphatic or heterocyclic amine with carbon monoxide in the presence of a sufficient amount of a copper compound catalyst to effect the carbonylation of the amine, an agent capable of oxidizing copper and a dehydrating agent.

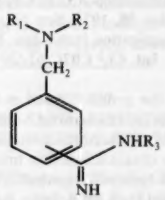
4,097,525

AROMATIC AMIDINES AS ANTIVIRAL AGENTS IN ANIMALS

Allen R. Kraska, East Lyme, and Rodney C. Schnur, Noank, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 769,854, Feb. 18, 1977, Pat. No. 4,066,696, which is a division of Ser. No. 708,180, Jul. 23, 1976, Pat. No. 4,025,555. This application Oct. 13, 1977, Ser. No. 841,832
Int. Cl.[2] C07C *123/00*
U.S. Cl. 260—564 R **7 Claims**

1. A compound of the structure



and the non-toxic acid addition salts thereof wherein

R_1 and R_2 are each alkyl of from 12 to 24 carbon atoms; and

R_3 is dimethylamino.

4,097,526

PREPARATION OF ORGANIC SULFONE COMPOUNDS

John Kai-Fai Chan, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,487
Int. Cl.[2] C07C *131/00*
U.S. Cl. 260—566 AC **27 Claims**

1. In a process for oxidizing an organic sulfide compound to its corresponding sulfone compound with a mixture of hydrogen peroxide and a carboxylic acid, the improvement which comprises conducting the reaction in the presence of a catalytically effective amount of a mineral or an organic sulfonic acid.

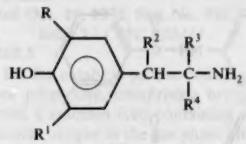
4,097,527

ANTIOXIDANTS AND PROCESS OF PREPARING SAID ANTIOXIDANTS

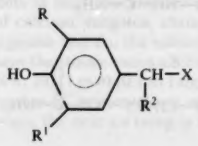
Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 9, 1971, Ser. No. 206,501
Int. Cl.[2] C07C *87/28*
U.S. Cl. 260—570.8 R **3 Claims**

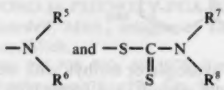
1. A process of preparing a compound having the following structural formula:



comprising (I) reacting, under basic conditions, a combination comprising (A) a phenolic compound having the following structural formula:



wherein X is selected from the group consisting of Cl, Br,



wherein R^5, R^6, R^7 and R^8 are alkyl radicals having 1 to 4 carbon atoms and (B) a nitroalkane having the following structural formula:

and (II) reducing the product of step (I), wherein R and R^1 are tertiary alkyl radicals having 4 to 8 carbon atoms, R^2 is selected from the group consisting of hydrogen and alkyl radicals having 1 to 6 carbon atoms, R^3 is selected from the group consisting of hydrogen and alkyl radicals having 1 to 6 carbon atoms and R^4 is an alkyl radical having 1 to 6 carbon atoms.

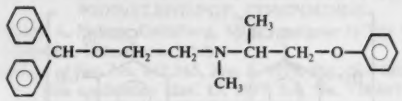
4,097,528

[N-(2-DIPHENYLMETHOXYETHYL)-N-(1-METHYL-2-PHENOXYETHYL)-N-METHYL] AMINE

Angel Lázaro Porta, and Antonio Ibáñez Paniello, both of Barcelona, Spain, assignors to Doctor Andreu, S.A., Spain

Filed Jul. 28, 1977, Ser. No. 819,900
Claims priority, application Spain, Aug. 5, 1976, 450.500; Aug. 5, 1976, 450.501; Aug. 5, 1976, 450.502; Aug. 5, 1976, 450.503
Int. Cl.[2] C07C *93/08*
U.S. Cl. 260—570 R **1 Claim**

1. [N-(2-diphenylmethoxyethyl)-N-(1-methyl-2-phenoxyethyl)-N-methyl] amine of the following structural formula:



(I)

and its pharmaceutically acceptable salts.

4,097,529

2-DECARBOXY-2-HYDROXYMETHYL-11-DEOXY-PGE$_1$ ANALOGS

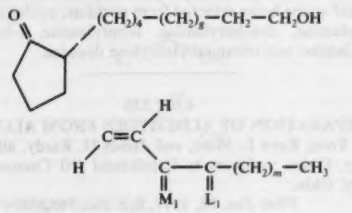
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,369, Jan. 28, 1976, Pat. No. 4,032,576. This application Apr. 6, 1977, Ser. No. 784,994

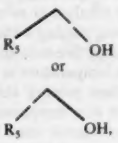
Int. Cl.^{2} C07C *49/46, 49/80, 49/82*

U.S. Cl. 260—586 R **15 Claims**

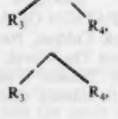
1. A prostaglandin analog of the formula



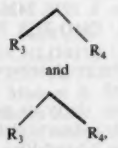
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein *g* is one, 2, or 3; and
wherein *m* is one to 5, inclusive;
with the proviso that at least one of R_3, R_4, and R_5 is methyl or at least one of R_3 and R_4 is fluoro.

4,097,530

PROCESS FOR THE PRODUCTION OF SQUARIC ACID

Manfred Schroeder, and Wolfgang Schaefer, both of Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Filed May 19, 1977, Ser. No. 798,546

Claims priority, application Germany, May 28, 1976, 2623836

Int. Cl.^{2} C07C *45/00*

U.S. Cl. 260—586 P **7 Claims**

1. A process for the production of squaric acid, comprising reacting hexachlorocyclobutene with 70–96% by weight sulfuric acid at 80°–150° C.

4,097,531

SUBSTITUTED CYCLOPROPANE PROCESS AND PRODUCT

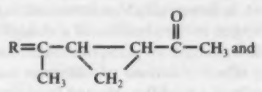
James O. Bledsoe, Jr., and Walter E. Johnson, Jr., both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

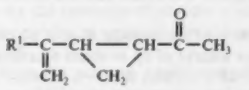
Continuation-in-part of Ser. No. 692,978, Jun. 4, 1976, abandoned. This application Apr. 11, 1977, Ser. No. 786,125

Int. Cl.^{2} C07C *45/00, 49/61*

U.S. Cl. 260—586 R **12 Claims**

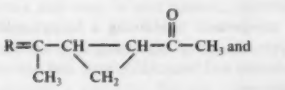
1. A substituted cyclopropane selected from the group represented by the following general structures:



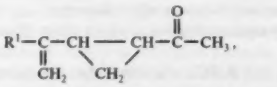


where R is a monovalent alkyl or alkylene radical, and R^1 is hydrogen or R.

5. The process for making substituted cyclopropane represented by the following general structures:



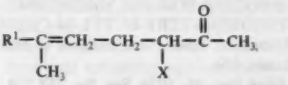
(I)



(II)

where R is a monovalent alkyl or alkenyl radical, and R^1 is hydrogen or R, which comprises:

heating at about 100° to 250° C. in the presence of an alkaline earth metal carbonate and liquid glycol vehicle, a compound represented by



(III)

where X is a halogen atom, until said substituted cyclopropane is formed.

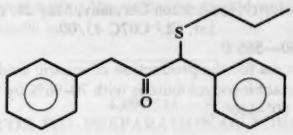
4,097,532

ALPHA-OXY(OXO)SULFIDES AND ETHERS

William J. Evers, Red Bank, and Howard H. Heinsohn, Jr., Hazlet, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 730,538, Oct. 7, 1976, Pat. No. 4,045,491.
This application Mar. 31, 1977, Ser. No. 783,485
Int. Cl.[2] C07C *49/76*
U.S. Cl. 260—590 D 1 Claim

1. The compound having the structure:



4,097,533

LIQUID PHASE PROCESS FOR THE PRODUCTION OF AROMATIC ALDEHYDES

John A. Scheben, Erlanger, Ky., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 19, 1976, Ser. No. 743,435
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—599 10 Claims

1. A process for the preparation of aromatic aldehydes which comprises contacting at a temperature of from about 140° to about 300° C toluene or a substituted toluene in which the substituent is lower alkyl or lower alkoxy in the liquid phase with oxygen in the presence of a catalyst comprising at least about 1% by weight of phosphoric acid and of water and a catalytically effective amount of palladium and at least about 0.01% by weight of a modifier selected from the group consisting of:

(a) compounds of the formula, R-Z in which R is alkyl, aryl, aralkyl or alkaryl of up to about 8 carbon atoms and Z is —SH, —SR′, —SSR′, R′SO—, $R'SO_2$— or

wherein R″ is H or lower alkyl and R′ has the same meaning as R;

(b) cyclic compounds containing a hetero sulfur atom selected from the group consisting of thiophene, phenothiazine, thiazole and benzothiophene and sulfones and sulfoxides thereof

(c) thiourea and N-lower alkyl thiourea;

(d) tertiary amines containing up to about 10 carbon atoms; and

(e) R_3PO_3 and R_3PO_4 wherein R has the same meaning as above,

said percents by weight being based on the weight of the supported catalyst.

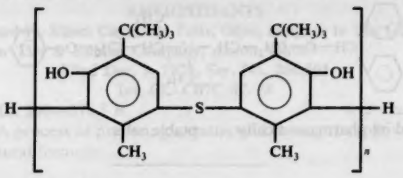
4,097,534

PROCESS FOR POLYMERIZING 4,4′-THIOBIS(6-TERT-BUTYL-M-CRESOL)

Richard H. Hirsch, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 16, 1976, Ser. No. 751,774
Int. Cl.[2] C07C *148/00*
U.S. Cl. 260—609 F 13 Claims

1. Process for preparing a polymer of the formula



wherein n has an average value of from about 1.5 to about 10 by polymerizing 4,4′-thiobis(6-tert-butyl-m-cresol) which comprises reacting said cresol with oxygen at a molar ratio of from about 2 to about 3.2 and at a temperature of from about 20° C. to about 80° C. in the presence of a copper salt/amine complex catalyst and an inert diluent, the molar ratio of said cresol to said complex being from about 35 to about 45, the molar ratio of said cresol to said amine being from about 40 to about 53 and the molar ratio of said copper salt to said amine being from about 0.8 to about 1.4, said copper salt being selected from chloride, bromide, acetate, propionate, palmitate and benzoate, and said amine being selected from pyridine, cyclohexylamine, diethylamine, di-n-butylamine, n-butylamine, t-butylamine, t-octylamine and tetramethylethylene diamine.

4,097,535

PREPARATION OF ALDEHYDES FROM ALCOHOLS

Kang Yang; Kaye L. Motz, and James D. Reedy, all of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Jan. 31, 1977, Ser. No. 763,958
Int. Cl.[2] C07C *45/16*
U.S. Cl. 260—603 C 7 Claims

1. In the method of preparing C_5 – C_{15} aldehydes from primary C_5 – C_{15} alcohols by passing alcohol and an oxygen-containing gas over silver catalyst at an elevated temperature the improvement comprising passing a the alcohol and an oxygen-containing gas through a pre-reactor zone, containing silver catalyst, and being at a temperature in the range of about 25° to about 300° C., and then passing the reactants through the reaction zone which is at a temperature of above 300° C. to about 600° C., said pre-reactor zone having a maximum temperature of at least from about 25° to 50° C. below the reaction zone temperature, said improved process being characterized further as providing a conversion of at least 90% with a selectivity of at least 85%.

4,097,536

PREPARATION OF A BLEACH

Robert Charles Patrick Cubbon, New Castle-U-Lyme; Peter John Russell, Eastham The Wirral; Robert Eric Talbot, Burtonwood, and David Thomas Woodbridge, Hitchin, all of England, assignors to Interox Chemicals Limited, London, England

Continuation-in-part of Ser. No. 683,817, May 6, 1976, abandoned. This application Apr. 26, 1977, Ser. No. 791,003
Claims priority, application United Kingdom, Nov. 18, 1975, 47388/75; Ireland, Nov. 1, 1976, 2426/76
Int. Cl.[2] C11D *7/38, 7/54, 7/18*
U.S. Cl. 260—610 R 16 Claims

1. A process for the production of diphthaloyl peroxide comprising the steps of:

(i) forming a mobile slurry or paste containing aqueous hydrogen peroxide and particulate phthalic anhydride in a mole ratio of from 2:1 to 1:10;

(ii) maintaining the slurry or paste mobile and mixing the slurry or paste for a period of at least half an hour at a temperature of from ambient to 50° C, thereby forming particulate diphthaloyl peroxide and;

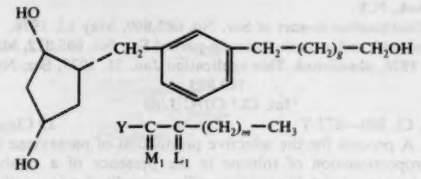
(iii) thereafter separating the diphthaloyl peroxide from the aqueous phase.

4,097,537
2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-PGF$_{1\alpha}$ COMPOUNDS

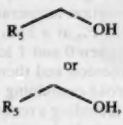
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Mar. 17, 1977, Ser. No. 778,647
Int. Cl.[2] C07C *35/00*
U.S. Cl. 568—807 22 Claims

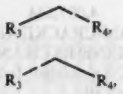
1. A prostaglandin analog of the formula



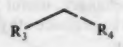
wherein Y is trans—CH=CH—;
wherein M_1 is



wherein
R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



and

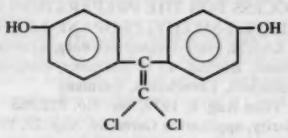
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and
R_4 is methyl only when the other is hydrogen or methyl; wherein g is one, 2, or 3; and wherein m is one to 5, inclusive.

4,097,538
DEHYDROCHLORINATION OF A DIHYDROXYDIPHENYL TRICHLOROETHANE

Arnold Factor, Scotia; Michael R. MacLaury, Rexford, and Jimmy L. Webb, Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 23, 1977, Ser. No. 771,208
Int. Cl.[2] C07C *37/00*
U.S. Cl. 568—726 3 Claims

1. The process for dehydrohalogenating 1,1,1-trichloro-2,2-bis(4-hydroxyphenyl) ethane to form the dichloroethylene compound of the formula



which process comprises (1) treating the aforesaid trichloroethane with from 3 to 20 moles anhydrous liquid ammonia per mole trichloroethane thereby to form a substantially pure dichloroethylene compound of the above formula, (2) removing unreacted ammonia, (3) dissolving the reaction product in an amount of a methanol/water mixture whose pH has been adjusted to from 3 to 11 sufficient to dissolve both the formed ammonium chloride and the aforesaid dichloroethylene compound, (4) heating the mixture of ingredients and then allowing the mixture to cool until precipitation of the dichloroethylene compound is accomplished and (5) isolating the precipitated dichloroethylene compound.

4,097,539
PROCESS OF SCRUBBING POLYHYDROXY PHENOLS FROM GAS

Hans-Martin Stönner, Schwalbach, and Paul Wiesner, Oberursel, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jul. 10, 1974, Ser. No. 486,998
Claims priority, application Germany, Dec. 28, 1973, 2365064
Int. Cl.[2] C07C *37/34*
U.S. Cl. 568—751 1 Claim

1. A process for the recovery of phenols in admixture with diisopropyl ether serving as an extraction solvent which comprises the steps of:

(a) deriving from the pressure gasification of coal and gas containing in addition to monovalent and polyvalent phenols, ammonia, carbon dioxide, hydrogen sulfide, ammonia salts with chlorine and fluorine, fatty acids, dust, tars and oils as impurities;

(b) scrubbing the gas derived in step (a) with water to produce a scrubbing aqueous mixture containing some of said impurities and some of said phenols, thereby producing a precleaned gas;

(c) cooling the precleaned gas to remove impurities therefrom;

(d) condensing a phenolic fraction from the cooled precleaned gas and removing tar and oil from the resulting condensate, said condensate constituting an aqueous mixture relatively rich in monovalent phenols;

(e) extracting said aqueous mixture relatively rich in monovalent phenols with diisopropyl ether solvent to extract said monovalent phenols and form a further solvent consisting of monovalent phenols and diisopropyl ether;

(f) extracting the scrubbing aqueous mixture separately from the aqueous mixture relatively rich in monovalent phenols with the further solvent produced in step (d) to extract the polyvalent phenols in said further solvent and leaving monovalent phenols in said scrubbing aqueous mixture; and

(g) extracting monovalent phenol with fresh diisopropyl ether from said scrubbing aqueous mixture after step (f) and combining the resulting mixture of diisopropyl ether and monovalent phenol with the further solvent used in step (f).

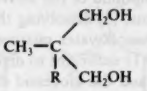
4,097,540

PROCESS FOR THE PREPARATION OF 2-ALKYL-2-METHYLPROPANE-1,3-DIOL

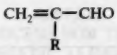
Otto Immel, Krefeld; Hans-Helmut Schwarz, Krefeld-Traar, and Oskar Weissel, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 8, 1977, Ser. No. 822,963
Claims priority, application Germany, Aug. 27, 1976, 2638733
Int. Cl.[2] C07C *29/14*
U.S. Cl. 568—862 14 Claims

1. A process for the preparation of a dihydric alcohol with the formula



wherein R represents an alkyl radical of 1 to 20 carbon atoms which comprises contacting a 2-alkylacrylaldehyde of the formula



wherein R has the meaning given above with formaldehyde and thereafter contacting the resultant reaction mixture with hydrogen in the presence of a hydrogenation catalyst.

4,097,541

PROCESS OF PRODUCING MAINLY MONOCYCLIC AROMATIC COMPOUNDS FROM UNUTILIZED CARBON RESOURCES MAINLY COMPOSED OF POLYCYCLIC AROMATIC COMPOUNDS

Tomoya Sakai, Nagoya, and Naoki Negishi, Tokyo, both of Japan, assignors to Kogyo Kaihatsu Kenkyusho (Industrial Research Institut), Tokyo, Japan

Continuation of Ser. No. 479,285, Jun. 14, 1974, abandoned. This application Aug. 13, 1976, Ser. No. 714,006
Claims priority, application Japan, Jun. 21, 1973, 48-69221; Mar. 13, 1974, 49-28046; Mar. 14, 1974, 49-28541; Mar. 14, 1974, 49-28542
Int. Cl.[2] C07C *1/20, 15/02*
U.S. Cl. 260—668 R 10 Claims

1. A method for decarbonylating an oxygen-containing condensed polycyclic aromatic hydrocarbon having at least one group selected from the group consisting of carbonyl, hydroxyl, and carboxyl which consists essentially of heating said oxygen-containing condensed polycyclic aromatic hydrocarbon at a temperature of from about 500° C to about 900° C under atmospheric pressure in contact with hydrogen and in the absence of a catalyst, to thereby stoichiometrically split off carbon monoxide.

4,097,542

PRODUCTION OF ALKYLBENZENES

Ivan James Samuel Lake, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 23, 1977, Ser. No. 827,098
Claims priority, application United Kingdom, Sep. 29, 1976, 40388/76
Int. Cl.[2] C07C *3/52*
U.S. Cl. 260—671 M 11 Claims

1. A process for effecting the alkylation of an aromatic hydrocarbon which comprises contacting an aromatic hydrocarbon with an alkylating agent under reaction conditions which are effective for accomplishing alkylation of the aromatic hydrocarbon and in the presence of a catalyst comprising zeolite nu-1 having a composition expressed by the formula

$$0.9 \text{ to } 1.3\ R_2O : Al_2O_3 : 20 \text{ to } 150\ SiO_2 : 0 \text{ to } 40 H_2O$$

where R is one or more of hydrogen, ammonium, phosphonium of 1/n of a cation having a valency *n* and having an X-ray diffraction pattern when R is H substantially as shown in Table 1.

4,097,543

SELECTIVE DISPROPORTIONATION OF TOLUENE

Werner O. Haag, Lawrenceville, and David H. Olson, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 685,869, May 12, 1976, abandoned, and a continuation-in-part of Ser. No. 685,872, May 12, 1976, abandoned. This application Jan. 21, 1977, Ser. No. 760,893
Int. Cl.[2] C07C *3/62*
U.S. Cl. 260—672 T 19 Claims

1. A process for the selective production of paraxylene by disproportionation of toluene in the presence of a catalyst comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12, which catalyst has undergone controlled precoking by exposing the same to a thermally decomposable organic compound at a temperature in excess of the decomposition temperature of said compound but less than about 1200° F., at a hydrogen to organic compound mole ratio of between 0 and 1 to deposit at least about 2 weight percent coke thereon and thereafter contacting toluene with the resulting coke-containing catalyst under disproportionation conditions including a temperature between about 800° F. and 1025° F. at a hydrogen to toluene mole ratio greater than 1 and up to about 10 and recovering a product mixture containing para-xylene in an amount greater than the thermodynamic equilibrium concentration thereof in the total xylenes produced.

4,097,544

SYSTEM FOR STEAM-CRACKING HYDROCARBONS AND TRANSFER-LINE EXCHANGER THEREFOR

Robert J. Hengstebeck, Valparaiso, Ind., assignor to Standard Oil Company, Chicago, Ill.

Filed Apr. 25, 1977, Ser. No. 790,329
Int. Cl.[2] C07C *3/30;* F28F *19/00*
U.S. Cl. 260—683 R 17 Claims

1. A transfer-line exchanger, useful in a system for steam-cracking hydrocarbons to produce ethylene, which comprises:

a vertical tank having:

a cylindrical intermediate portion with side openings adjacent the top and bottom ends to withdraw and introduce, respectively, fluid coolant;

a conical bottom entrance end portion connected to the bottom end of said intermediate portion; and

a conical top exit end portion connected to the top end of said intermediate portion;

a horizontal top tube sheet having a number of openings and supported by said tank at the top end of said intermediate portion of said tank;

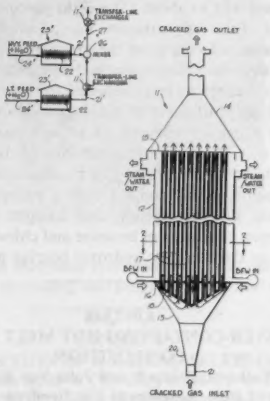
a horizontal bottom tube sheet having a number of openings corresponding to and in vertical alignment with said openings in said top tube sheet, said bottom tube sheet being supported in said tank at the bottom end of said intermediate portion of said tank;

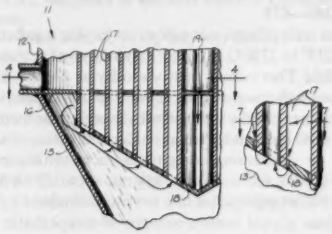
a conical shield having its vertex below its base and supported within said conical bottom entrance end portion of said tank to provide an upper chamber between said shield and said bottom tube sheet and a lower chamber between said shield and the bottom part of said conical bottom entrance end portion, said shield having openings in vertical alignment with said openings in said tube sheets;

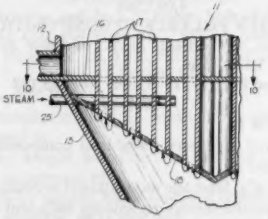
a number of vertical tubes in said openings of said top tube sheet and extending through said bottom tube sheet to said openings in said conical shield; and

means to introduce steam into the chamber between said conical shield and said bottom tube sheet,

said conical shield being constructed with respect to said tubes or said conical bottom entrance end portion so that steam introduced into said upper chamber between said conical shield and said bottom tube sheet can pass downwardly into said lower chamber in said conical bottom entrance end portion to mix with gas passing upwardly through said conical bottom entrance end portion of said tank before the gas passes upwardly through said tubes.







10. A system, as an apparatus, for steam-cracking hydrocarbons to produce a gaseous steam-cracked product containing ethylene, which comprises:

a first furnace for steam-cracking a heavy hydrocarbon feed, said first cracking furnace having a pipe with an inlet for entrance of the heavy hydrocarbon feed with water and an outlet for gaseous cracked product;

a second furnace for steam-cracking a lighter hydrocarbon feed, said second cracking furnace having a pipe with an inlet for entrance of the lighter hydrocarbon feed with water and an outlet for gaseous cracked product;

a mixer having first inlet, a second inlet and an outlet, said first inlet being connected to said outlet of said pipe of said first furnace;

a first transfer-line exchanger having an outlet connected to said second inlet of said mixer and an inlet connected to said outlet of said pipe of said second furnace; and

a second transfer-line exchanger having an inlet connected to said outlet of said mixer,

whereby, in the use of the apparatus, the gaseous cracked product from the lighter hydrocarbon feed is cooled by passage through said first transfer-line exchanger and then mixed with the gaseous cracked product from the heavy hydrocarbon feed before that product from the heavy hydrocarbon feed is passed through the second transfer-line exchanger.

15. A system, as a process, for steam-cracking hydrocarbons to produce a gaseous steam-cracked product containing ethylene, which comprises:

steam-cracking a heavy hydrocarbon feed at an elevated temperature to produce a first gaseous steam-cracked product containing ethylene;

separately steam-cracking a lighter hydrocarbon at an elevated temperature to pro-uce a second gaseous steam-cracked product containing ethylene;

cooling the second gaseous steam-cracked product by passing it through a transfer-line exchanger in indirect heat exchange relationship with an aqueous fluid coolant;

mixing the cooled second gaseous steam-cracked product with the first gaseous steam-cracked product; and

passing the mixture through a second transfer-line exchanger for indirect heat exchange relationship with aqueous fluid coolant.

4,097,545

HEAT-RESISTANT THERMOSETTING POLYIMIDE RESIN WITH BIS-PHENOL-EPICHLOROHYDRIN REACTION PRODUCT

Keiichi Akiyama, Yokosuka; Junichi Kamiuchi, Yokohama; Itsuo Matsuda, Chofu, and Takara Fujii, Yokohama, all of Japan, assignors to Toshiba Chemical Products Co. Ltd., Tokyo, Japan

Division of Ser. No. 615,933, Sep. 25, 1975. This application Aug. 30, 1976, Ser. No. 718,931

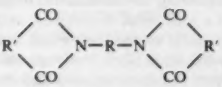
Claims priority, application Japan, Sep. 25, 1974, 49-109505; Mar. 6, 1975, 50-27292; Mar. 6, 1975, 50-27293

Int. Cl.[2] C08L *63/02*

U.S. Cl. 260—830 P **8 Claims**

1. A heat-resistant thermosetting resin composition consisting essentially of a reaction product of components (A), (B) and (C) wherein:

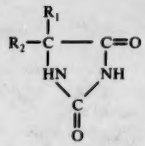
(A) is a mixture of (a) at least one N,N′-bisimide of unsaturated dicarboxlic acid expressed by the general formula:



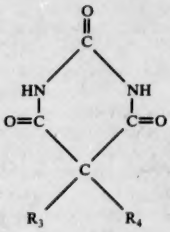
wherein R is a divalent radical having at least two carbon atoms and R′ is a divalent radical having a carbon-carbon double bond, and (b) about 30% by weight based on the total weight of (a) plus (b) of a reaction product of bisphenol with epichlorohydrin,

(B) is at least one selected from the group consisting of cyanuric acid, isocyanuric acid and tris (epoxy propyl) isocyanurate, and

(C) is at least one compound selected from the group consisting of pyromellitic diimide; benzophenone tetracarboxylic acid diimide; 2, 3, 5, 7-naphthalene-tetracarboxylic acid diimide; 3,3′, 4, 4′-diphenyltetra-carboxylic acid diimide; hydantoin or derivative of the formula:



wherein R_1 and R_2 may be the same or different and represent hydrogen or one to three carbon atom alkyl radicals, and barbituric acid or derivative of the formula:



wherein R_3 and R_4 may be the same or different and represent hydrogen or one to five carbon atom alkyl radicals.

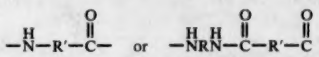
4,097,546

OZONE RESISTANT, CATIONIC DYEABLE NYLON CONTAINING LITHIUM, MAGNESIUM OR CALCIUM SALTS OF SULFONATED POLYSTYRENE COPOLYMERS

Robert Alden Lofquist, Richmond, Va., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Mar. 30, 1976, Ser. No. 671,789
Int. Cl.[2] C08L *77/00*
U.S. Cl. 260—857 UN **8 Claims**

1. In a method to make a fiber-forming synthetic linear polyamide having a repeating structure of



where R and R′ are radicals of 3 to 13 carbon atoms, receptive to cationic dyes by the addition of a sulfonated polystyrene or salt thereof, said polyamide having from about 10 to about 60 amine gram equivalents per 10^6 grams of polymer and a ratio of less than ten sulfonate gram equivalents per amine gram equivalents, the improvement comprising

adding to said polyamide a water soluble salt selected from the group consisting of the lithium, magnesium and calcium salts of a sulfonated copolymer, said salt sulfonated to over 90 percent of the theoretical maximum of complete monosulfonation of each styrene residue moiety and having a pH of between about 3 and 8, said sulfonated copolymer is selected from the group consisting of a copolymer containing at least 50% by weight of styrene or vinyl toluene reacted with each other or at least one of the following monomers or their next adjacent homologs, acrylonitrile, acrylate esters, methacrylate esters, acrylic acid, methacrylic acid, butene, methyl vinyl ether, ethylene, propene, 2-pentene, 2-methyl propene, said salt has a molecular weight of from about 15,000 to about 300,000 and the concentration of sulfonates present in the polyamide containing the salt is between about 50 and about 150 gram equivalents per 10^6 *l grams polymer, and*

shaping said polyamide into a shaped article,

whereby said dyed polyamide article has highly improved resistance to fading of the cationic dye due to exposure to ozone.

4,097,547

STABILIZED POLYCARBONATES

Thomas H. Cleveland, and John V. Bailey, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Division of Ser. No. 165,300, Jul. 22, 1971, Pat. No. 3,733,296, which is a continuation-in-part of Ser. No. 342, Jan. 2, 1970, abandoned. This application Dec. 26, 1972, Ser. No. 318,323
Int. Cl.[2] C08K *3/26*
U.S. Cl. 260—860 **12 Claims**

1. A polycarbonate composition comprising in admixture an aromatic polycarbonate of a dihydric phenol and a carbonate precursor and 0.01 to about 5.0 weight percent, based on the total weight of the polycarbonate composition, of an alkaline earth carbonate selected from the group consisting of barium carbonate, strontium carbonate, and calcium carbonate; said aromatic polycarbonate being selected from the group consisting of (a) a polycarbonate of a halogen substituted dihydric phenol, (b) a copolycarbonate of an unsubstituted dihydric phenol and a halogen substituted dihydric phenol, (c) mixtures of (a) and (b) and (d) mixtures of a member selected from the group consisting of (a) and (b) with a polycarbonate of an unsubstituted dihydric phenol; said halogen being selected from the group consisting of bromine and chlorine and being a substituent on the aromatic hydroxyl bearing phenyl moiety.

4,097,548

POLYESTER-CONTAINING HOT MELT ADHESIVE COMPOSITION

Mohan V. Kulkarni, Ashland, and John Von Kamp, New London, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 23, 1977, Ser. No. 809,479
Int. Cl.[2] C08L *67/06*
U.S. Cl. 260—873 **6 Claims**

1. A hot melt adhesive composition having a softening point of about 215° to 225° C., a Shore D hardness of at least 50 to 60; a Brookfield Thermoseal melt viscosity at 245° C. of 1000 to 1500 poises and comprised of about 9 to 30 percent by weight of a copolymer of ethylene and ethyl acrylate or methacrylate, about 40 to 45 percent by weight of a copolyester of a structure obtained by condensing terephthalic acid with a mixture of ethylene glycol and neopentyl glycol, about 50 to 55 percent by weight of a terpolyester of a structure obtained by condensing ethylene glycol with a mixture of terephthalic acid, isophthalic acid and azelaic acid.

4,097,549

POLYMER POLYBLEND COMPOSITION

Robert L. Kruse, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 645,138
Int. Cl.[2] C08L *51/04*
U.S. Cl. 260—876 R **17 Claims**

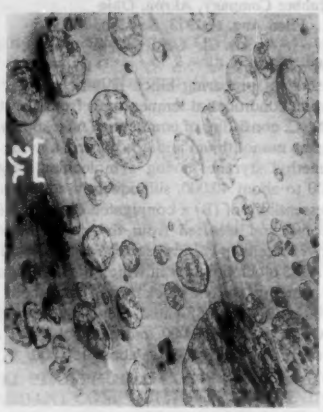
1. An improved polymeric polyblend composition characterized by a blend of:

A. a polymer of at least one monoalkenyl aromatic monomer having dispersed therein an amount sufficient to toughen said polymer of

B. a diene rubber, said rubber being dispersed as crosslinked rubber particles being grafted with said monomer as polymer and having occluded therein said polymer, said particles having a weight average diameter of from about 0.5 to 10 microns, wherein said improvement comprises:

C. said rubber particles having a rubber moiety structured in a morphological form comprising rubber fibres or rubber sheets and mixtures thereof said polymeric polyblend being prepared by polymerizing continuously a solution of said monoalkenyl aromatic monomer and said diene rubber under catalytic conditions with back mixed agitation

to about 10 to 50% conversion; then discontinuing such agitation and continuing the polymerization of said solu-



tion until the monomer is substantially polymerized; then heating and separating said polyblend from said monomer.

4,097,550

COMPOSITION OF A RADIAL TELEBLOCK COPOLYMER AND A COPOLYMER OF A VINYL AROMATIC COMPOUND AND AN α,β UNSATURATED CYCLIC ANHYDRIDE

William Robert Haaf, Voorhesville; Gim Fun Lee, Jr., Albany, both of N.Y., assignors to General Electric Compnay, Pittsfield, Mass.

Filed Jun. 8, 1976, Ser. No. 693,895
Int. Cl.[2] C08L *51/00, 53/00*
U.S. Cl. 260—876 B 13 Claims

1. A thermoplastic molding composition which consists essentially of, in intimate admixture:

(i) a copolymer of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride, and

(ii) a radial teleblock copolymer of a vinyl aromatic compound, a conjugated diene, and a coupling agent.

4,097,551

RUBBER MODIFIED DICARBOXYLIC ACID COPOLYMER BLENDS

Adolph V. DiGiulio, and Jack N. Bauer, both of Pittsburgh, Pa., assignors to Arco Polymers, Inc., Philadelphia, Pa.

Filed Dec. 20, 1976, Ser. No. 752,239
Int. Cl.[2] C08L *53/02*
U.S. Cl. 260—876 B 8 Claims

1. A thermoplastic molding composition consisting essentially of a blend of

a. 5-15% by weight, based on total molding composition, of a block copolymer of

A. 2-50% by weight, based on block copolymer, of monovinyl aromatic monomer and

B. 50-98% by weight, based on block copolymer, of a conjugated diene monomer, and

b. 85-95% by weight, based on total molding composition, of a copolymer made by polymerizing

A. 60-95% by weight, based on copolymer (b), of a mixture of

(1) 4-35% by weight of an ethylenically unsaturated dicarboxylic acid moiety and

(2) 65-96% by weight of one or more monomers copolymerizable therewith selected from the group consisting of monovinyl aryl monomers, unsaturated nitriles, and acrylic monomers, in the presence of

B. 5-40% by weight, based on copolymer (b), of a diene rubber;

whereby the sum of the block copolymer (a) and the diene rubber (bB) is 9-50% by weight of the total molding composition.

4,097,552

NITROGENOUS POLYMER COMPOSITIONS

Gary L. Deets, Springfield, and Peter Shapras, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 20, 1977, Ser. No. 807,870
Int. Cl.[2] C08K *3/06, 3/22*
U.S. Cl. 260—876 R 6 Claims

1. A polymer composition comprising a nitrogenous polymer and from 2.5 to 20 percent by weight of an alkaline earth metal oxide and from 2.5 to 20 percent by weight of sulfur, all percentages being based on the polymer weight.

4,097,553

ACRYLIC GRAFT COPOLYMERS BLENDED WITH ACRYLIC RESINS

Ernest Richard Novak, Vienna, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 20, 1977, Ser. No. 808,396
Int. Cl.[2] C08L *51/00, 53/00*
U.S. Cl. 260—876 R 5 Claims

1. A method of improving the handleability of a resilient, acrylic graft rubber composed of particles having an outer layer consisting essentially of an alkyl methacrylate polymer which has a glass transition temperature greater than 25° C. and the alkyl group has 1–4 carbon atoms, and at least one inner layer consisting essentially of a resilient acrylic copolymer that has a glass transition temperature of 25° C or less which comprises mixing the acrylic graft rubber while still in its emulsion polymerization medium with a solution of an ionizable salt in which the salt is present in an amount between about 1 and 100 gm/liter in an amount such that the resulting mixture contains between about 5 and about 25 times by weight as much acrylic graft rubber as ionizable salt, and, agitating the resulting mixture at a temperature between about 30°–70° C. until the graft rubber particles coagulate, then adding to the coagulated dispersion a dispersion of an alkyl methacrylate resin prepared by emulsion polymerization which has a glass transition temperature greater than 25° C. and the alkyl group has 1–4 carbon atoms, in an amount sufficient to result in the presence of between about 10 and 99% by weight acrylic graft rubber in the resulting mixture based on weight of rubber and said alkyl methacrylate resin, and agitating the resulting mixture at a temperature between about 60°–120° C., followed by isolating the coagulated materials.

4,097,554

PROCESS FOR PREPARING NOVEL POLYMER PARTICLES

Hiroshi Yui; Tetsuji Kakizaki; Hironari Sano; Masakazu Arai, and Hiroshi Matsui, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed Sep. 7, 1976, Ser. No. 720,761
Claims priority, application Japan, Sep. 8, 1975, 50-108739
Int. Cl.[2] C08F *255/02*
U.S. Cl. 260—878 R 17 Claims

1. A process for preparing novel propylene polymer particles which comprises:

(a) preparing an aqueous suspension comprising 100 parts by weight of propylene polymer particles, about 5 to 200 parts by weight of a vinyl or vinylidene monomer, and about 0.01 to 1 part by weight, to 100 parts by weight of the monomer, of a radical polymerization initiator having a decomposition temperature of about 85° to 130° C for obtaining a half-value period of 10 hours;

(b) heating the resulting aqueous suspension under such conditions that substantially no decomposition of the

initiator takes place thereby to impregnate the propylene polymer particles with the monomer to such an extent that less than about 20% by weight of the monomer remains free in the liquid phase; and

(c) raising the temperature of the aqueous suspension to substantially complete the polymerization of the monomer.

4,097,555

TRANSPARENT POLYMERIC POLYBLEND

James R. Moran, Hampden, Mass., assignor to Monsano Company, St. Louis, Mo.

Filed May 11, 1976, Ser. No. 685,240
Int. Cl.[2] C08F *291/02*; C08L *51/00, 53/00*
U.S. Cl. 260—880 R **14 Claims**

1. An improved transparent polymeric polyblend composition formed of diene, alkenyl aromatic, alkenyl nitrile and acrylate monomers having improved color, toughness and transparency comprising:

A. from about 70 to 98 percent by weight of a matrix terpolymer having from about 35 to 45 percent by weight of an alkenyl aromatic monomer, from about 15 to 25 percent by weight of an alkenyl nitrile monomer and from about 35 to 45 percent by weight of an acrylate monomer selected from the group consisting of alkyl acrylate and alkyl alkacrylate monomers, wherein the improvement comprises: having dispersed therein from 1 to 20 percent by weight of,

B. a block diene copolymer rubber as rubber particles having an average particle size of 0.30 to 1.5 microns, said rubber particle being grafted with and have occluded a terpolymer having a composition substantially that of said matrix terpolymer wherein said graft and occluded terpolymers are present in amounts of from 0.50 to 5.0 parts per part of said rubber.

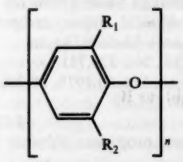
4,097,556

PPO-GRAFT COPOLYMER AND PROCESS FOR PRODUCING THE SAME

Kunio Toyama, Yokohama; Isamu Shimizu, Yamato; Takeo Imamura, Yokohama, and Atsuo Nakanishi, Kanagawa, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Feb. 7, 1977, Ser. No. 766,515
Claims priority, application Japan, May 24, 1976, 51-59053
Int. Cl.[2] C08L *51/08*
U.S. Cl. 260—886 **19 Claims**

1. A graft copolymer comprising polyphenylene ether having styrene polymer segments grafted thereon improved in moldability, said styrene polymer segments being formed by melting and kneading continuously a mixture of (a) polyphenylene ether expressed by the general formula of:



wherein R_1 and R_2 represent an alkyl group having 1–4 carbon atoms or a halogen atom, respectively, and *n* represents the degree of polymerization and is 90–250, (b) a styrene polymer containing at least 80 weight % of styrene units and (c) styrene-containing monomers in the presence of a radical initiator at a temperature in the range from 160° to 300° C thereby to complete graft polymerization within a time ranging from 0.5 to 15 minutes.

4,097,557

METHOD OF PREPARING BLOCK POLYMERS

Robert E. Cunningham, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 6, 1973, Ser. No. 385,915
Int. Cl.[2] C08F *297/04*
U.S. Cl. 260—880 B **7 Claims**

1. A method of preparing block polymers under solution polymerization conditions at temperatures from about −20° C to about 100° C, consisting of contacting (A) α-methyl styrene with an organo monolithium initiator to form a living polymer of poly-α-methyl styrene having a molecular weight from about 10,000 to about 40,000, subsequently adding a mixture consisting essentially of (B) a conjugated diene and (C) vinyl aromatic compound selected from the group consisting of styrene, vinyl toluene, p-(t-butyl)styrene and p-(ethyl)styrene, to form an ABC block polymer in which the molecular weight of the poly-α-methyl styrene block ranges from about 10,000 to about 40,000, the polyconjugated diene block ranges from about 40,000 to about 150,000 and the polyvinyl aromatic block ranges from about 40,000 to about 150,000.

4,097,558

RESIN BLEND FOR MAKING PLASTISOLS AND ORGANOSOLS

Leroy B. Kuhn, Easton, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 624,497, Oct. 21, 1975, abandoned, which is a division of Ser. No. 506,131, Sep. 18, 1974, Pat. No. 4,002,702, which is a continuation-in-part of Ser. No. 403,363, Oct. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 202,456, Nov. 26, 1971, abandoned. This application Apr. 7, 1977, Ser. No. 785,484
Int. Cl.[2] C08L *27/06*
U.S. Cl. 260—899 **26 Claims**

1. A bulk handleable, dry, non-coagulated blend of vinyl chloride emulsion resin and vinyl chloride suspension resin adapted for use in preparing plastisols and organosols, said blend comprising:

(a) from about 30% to about 99%, by weight, of particles of vinyl chloride emulsion resin having an average diameter in the range of from about 0.1 to about 3.0 microns and a relative viscosity as determined as a 1%, by weight, solution in cyclohexanone at 25° C., of from about 1.5 to about 3.5; and

(b) from about 1% to about 70%, by weight, of particles of vinyl chloride suspension resin having an average particle diameter in the range of from about 5 to about 60 microns and a relative viscosity as determined as a 1%, by weight, solution in cyclohexanone at 25° C., of from about 1.5 to about 3.5, substantially all of the emulsion and suspension resin particles in the blend being in the form of a plurality of structures wherein a plurality of emulsion resin particles are in contact with at least one centrally positioned suspension resin particle.

4,097,559

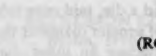
CHLOROALKYL POLYPHOSPHATES METHOD FOR MAKING SAME

Anthony Joseph Papa, Saint Albans, and Walter Warren Runyan, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

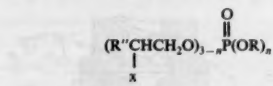
Filed Dec. 29, 1975, Ser. No. 644,789
Int. Cl.[2] C08K *5/52*; C07F *9/09*
U.S. Cl. 260—928 **20 Claims**

1. A process for producing polyphosphates which comprises

A. reacting an unsubstituted trialkylphosphate having the following structure:



wherein R is CH_3, C_2H_5, C_3H_7 or C_4H_9; R′ is a C_5 to C_{10} hydrocarbon chain and n is 0, 1 or 2 with a 2-haloalkyl phosphate having the following structure:



wherein x is Cl or Br; R″ is H, CH_3, CH_2Cl or CH_2Br; and R and n are defined above, in the presence of a catalyst, for a time and at a temperature sufficient to produce polyphosphate thermal condensates of the reactants, and

B. recovering said polyphosphate thermal condensates.

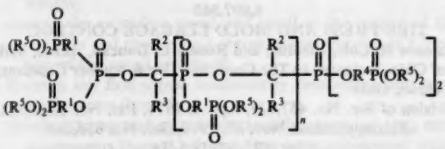
4,097,560

NOVEL PHOSPHORUS COMPOUNDS AND FLAME RETARDANT COMPOSITIONS CONTAINING SAME

Stanley Littman, Sharon, Mass., and Irving Touval, Edison, N.J., assignors to M & T Chemicals Inc., Stamford, Conn.

Filed Jun. 29, 1977, Ser. No. 811,050
Int. Cl.² C07F *9/28*; C08K *5/53*
U.S. Cl. 260—931 **22 Claims**

9. A flame retardant composition consisting essentially of (1) a substrate that, in turn, consists essentially of a natural or synthetic organic polymer, and (2) a flame retarding agent of the general formula



wherein R^1 and R^4 are each the same or different alkylene and contain from 1 to 12 carbon atoms, R^2 and R^3 are individually selected from the group consisting of hydrogen and alkyl containing from 1 to 12 carbon atoms, R^5 is alkyl and contains from 1 to 12 carbon atoms and n represents an integer having an average value of from 1 to about 50, wherein the amount of said flame retarding agent is sufficient to impart the desired level of flame retardancy to said substrate.

4,097,561

IDLE MIXTURE ADJUSTING DEVICE OF CARBURETOR

Chichitada Seki, Yokosuka, and Nobuo Furuhashi, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jan. 12, 1977, Ser. No. 758,815
Claims priority, application Japan, Apr. 23, 1976, 5151735[U]
Int. Cl.² F02M *3/08*
U.S. Cl. 261—41 D **7 Claims**

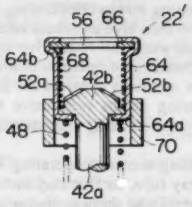
1. A Combination comprising:

An idle adjustment screw turnably and operatively installed in a carburetor of an internal combustion engine, for adjusting an air-fuel mixture supplied to the engine during idling of the engine when turned, said idle adjustment screw having a screw head formed with first engageable means;

a turning tool for turning the screw head of said idle adjustment screw, said turning tool having an end portion formed with second engageable means which is engageable with the first engageable means of said idle adjustment screw to turn said idle adjustment screw after the second engageable means engages with the first engageable means; and

a covering member for covering the screw head of said idle adjustment screw, said covering member including

a cylindrical member surrounding the screw head of said idle adjustment screw and secured to the body of the carburetor so that only its axial movement is permitted, said cylindrical member having an annular groove formed at one end thereof and a flange portion at the other end thereof, the flange portion being contactable to the bottom surface of the screw head of said idle adjustment screw,



a disc member turnably received at the annular groove of said cylindrical member the disc member having a slot formed through the wall thereof, the slot being generally in the shape which is produced by projecting the shape of the second engageable means on the surface of said disc member,

a first spring disposed inside of said cylindrical member to urge the disc member so that the movement of the disc member within the annular groove of said cylindrical member is restricted, and

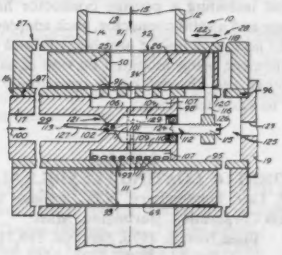
a second spring disposed between the body of the carburetor and the flange portion of said cylindrical member to urge the flange portion to contact the bottom surface of the screw head of said idle adjustment screw.

4,097,562

CARBURETOR

Douglas Hayward Blakeway, Burnaby, Canada, assignor to Blakeway Industries Ltd., North Vancouver, Canada

Continuation-in-part of Ser. No. 628,759, Nov. 4, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 806,142
Int. Cl.² F02M *11/08*
U.S. Cl. 261—41 B **28 Claims**



1. A carburetor for mixing air and fuel prior to combustion, the carburetor having a body with a throat having a throat central axis and a sidewall, the carburetor being characterized by:

(a) a fuel spray tube having jet means and extending into the throat generally normally to the throat axis and being adapted to receive fuel and to discharge fuel into the throat,

(b) a valve assembly having: a valve axis extending across

the throat and normally to the throat central axis, first and second sliding gate valve members, and complementary valve guide means to mount the valve members for generally transverse sliding along the valve axis between closed and wide open positions; each valve member having an inner portion having an inner edge disposed generally symmetrically about the valve axis and shaped to correspond to approximately one half of the sidewall of the throat in the wide open position, the valve members being adapted to cooperate with each other so that inner portions thereof overlap each other to close essentially the throat when in the closed position, and also to cooperate with the the jet means of the fuel spray tube so as to open and close the jet means as required,

(c) valve actuating means cooperating with the valve members to move the valve members concurrently in opposite directions between the respective open and closed positions in response to an operator control so that movement of the valve members controls the jet means,

(d) fuel metering means responsive to valve position to meter fuel prior to being discharged from the fuel spray tube,

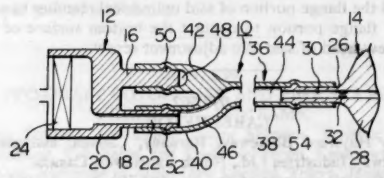
(e) fuel atomizing means cooperating with the jet means of the fuel spray tube, so that fuel metered by the metering means atomizes and there is discharged into the throat an acceptable fuel mixture for combustion for all valve positions.

4,097,563

ALTITUDE CORRECTION DEVICE OF A CARBURETOR

Haruo Yuzawa, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jan. 8, 1976, Ser. No. 647,555
Claims priority, application Japan, Jan. 14, 1975, 50-6637
Int. Cl.[2] F02M 7/24
U.S. Cl. 261—121 B **3 Claims**



1. Fuel supply apparatus and means to manually control the supply of supplemented air into a fuel passage thereof, comprising a hollow coupling member, a housing mounting a filter element and including a passage connector having an open axial passage and a solid connector, each adapted to optionally receive said hollow coupling member, one end of said hollow coupling member being mounted on one of said connectors, and the other end thereof being operatively connected to supply air to said fuel passage.

4,097,564

METHOD OF COATING FLEXIBLE SLEEVING

Wilbert M. Lair, Londonderry, N.H., assignor to Electronized Chemicals Corporation, Burlington, Mass.

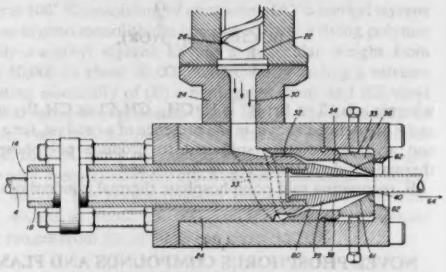
Filed Nov. 8, 1976, Ser. No. 739,718
Int. Cl.[2] B29F 3/08, 3/10
U.S. Cl. 264—22 **8 Claims**

1. A process for coating continuous lengths of flexible sleeving with an electrically insulative resinous material comprising the steps of:

(a) passing the flexible sleeving through a preheating unit;

(b) heating the flexible sleeving in the preheating unit to an outside surface temperature insufficient to damage the flexible sleeving yet sufficient to aid extrudate bonding thereto between 500° and 800° F;

(c) passing the preheated flexible sleeving issuing from the preheating unit through a crosshead extrusion die assembly having a core tube, a tip, and a die, said core tube and tip defining a sleeving passage of greater diameter than the flexible sleeving, said die providing an inner diameter greater than that of the flexible sleeving and having substantially zero land length, said tip and said die defining an extrudate channel meeting said sleeving passage at an acute angle between said tip and said die;



(d) extruding an electrically insulative resinous material onto said flexible sleeving under conditions of very low radial pressure and comparatively high axial pressure in said crosshead extrusion die assembly; and

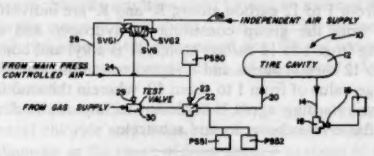
(e) cooling the coated, flexible sleeving issuing from said crosshead extrusion die assembly.

4,097,565

TIRE PRESS AND MOLD LEAKAGE CONTROL

Clarence R. Cole, Medina, and Robert L. Duncan, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 457,029, Apr. 1, 1974, Pat. No. 3,942,922.
This application Nov. 28, 1975, Ser. No. 636,346
Int. Cl.[2] B29H 5/24
U.S. Cl. 264—40.3 **2 Claims**



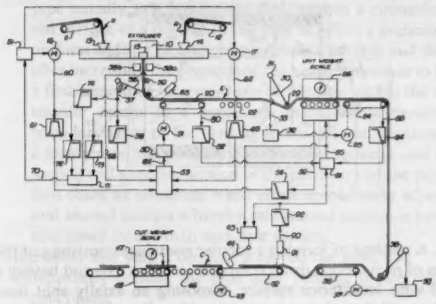
1. The method of preventing under-cure in curing a tire in an automatic succession of tires, the tire having a cavity, said curing being effected in a tire mold during a predetermined time cycle wherein the curing is effected by steam which supplies heat, and by inert gas which supplies pressure in said cavity, the pressure of said gas being greater than the pressure of said steam, the method comprising admitting steam into said cavity during a first part of said cycle, then stopping flow of steam into the cavity and admitting an inert gas during a second part of said cycle, during said second part of the cycle closing said cavity to flow communication into and out of the cavity while the cavity contains both steam and inert gas for a predetermined time period less than said second part of the cycle, monitoring the pressure in said cavity during said time period to detect a time rate of change of pressure in excess of a predetermined acceptable rate and extending said time cycle in response to detection of such time rate of change to said excess to compensate for reduction in the quantity of heat due to cooling of the steam by the inert gas and provide for complete cure of the tire.

4,097,566

EXTRUSION LINE CONTROL SYSTEM

Michael C. Bertin, Irvine; Richard L. Hicksted, Orange, and James M. Mitsuhashi, Los Angeles, all of Calif., assignors to Nucleonics Data Systems, Irvine, Calif.

Filed Jun. 1, 1977, Ser. No. 802,442
Int. Cl.[2] B29F *3/00*
U.S. Cl. 264—40.7 40 Claims



31. A method of controlling a rubber extrusion line having an extruder, a take away conveyor, a unit weight scale, and a skiver, with the extrudate moving in a continuous strip from the extruder onto the take away conveyor, past the unit weight scale to the skiver, including the steps of:

sensing the weight measured at the unit weight scale and producing a first signal varying as a function of the weight;

sensing the extrudate speed and swell at the output of the extruder and producing a second signal varying as a function of the speed and swell;

filtering the first signal substantially removing short term components thereof;

filtering the second signal substantially removing long term components thereof, where a long term component varies with a period of about 10 to about 60 minutes and a short term component varies with a period of about 2 to about 60 seconds; and

varying the speed of the take away conveyor as a function of the combination of the filtered first and second signals.

4,097,567

TITANIUM DIBORIDE SHAPES

Walter S. Cebulak, New Kensington, and John D. Weyand, Greensburg, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 25, 1976, Ser. No. 717,698
Int. Cl.[2] C04B *33/32, 35/64*
U.S. Cl. 264—65 1 Claim

1. The method comprising blending a mixture consisting of 90 parts by weight titanium diboride and 10 parts by weight boron nitride, cold isostatically pressing the blend to a shape at 60,000 pounds per square inch pressure, and sintering the shape at 1975° C in an inert atmosphere in the absence of pressure.

4,097,568

WALL CONSTRUCTION

Kevin M. Foley, Toledo; Harold A. Dewhurst, and Frank P. McCombs, both of Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 617,353, Sep. 29, 1975, Pat. No. 4,003,173. This application Aug. 30, 1976, Ser. No. 719,013
Int. Cl.[2] F16L *9/08*
U.S. Cl. 264—216 5 Claims

1. A method for producing a cylindrical wall comprising the steps of:

(a) applying a filler and cement to a continuously rotating cylindrical form;

(b) distributing glass fibers in random orientation and then adding phenol, formaldehyde, and at least one polyhydric phenolic compound alone or in combination with an amino compound while continuing the rotation of the form; and

(c) curing the resin.

4,097,569

MODIFIED VINYL ESTER RESIN AND PIPE MADE THEREFROM

William D. Waters, Tulsa, Okla., assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio

Division of Ser. No. 589,539, Jun. 23, 1975, Pat. No. 4,018,250, which is a division of Ser. No. 428,118, Dec. 26, 1973, Pat. No. 3,928,491. This application Oct. 13, 1976, Ser. No. 732,034
Int. Cl.[2] B29C *5/04*
U.S. Cl. 264—255 2 Claims

1. The method for forming centrifugally cast pipe comprising:

inserting a sock of fibrous reinforcing material into the mold of a centrifugal casting machine;

injecting into said mold a quantity of a first thermosetting resin, said quantity being sufficient to substantially encapsulate said reinforcing material,

rotating said mold so as to distribute said injected first resin longitudinally of said mold throughout said reinforcing material to thereby form within said mold a cylindrical matrix of said first thermosetting resin and said fibrous reinforcing material,

injecting into the bore of said cylindrical matrix of said first thermosetting resin and said fibrous reinforcing material a second thermosetting resin comprising an admixture of (1) a neat thermosetting resin formed by reacting an epoxy resin, a carboxyl terminated elastomer selected from the group consisting of carboxyl terminated homopolymers and copolymers of conjugated dienes and an unsaturated monocarboxylic acid, with approximately one chemical equivalent of epoxy being provided for each chemical equivalent of carboxyl provided by said elastomer and said acid combined and (2) an ethylenically unsaturated monomer,

rotating said mold to distribute said second thermosetting resin longitudinally thereof to form an unreinforced inner liner for said pipe on the inner surface of said cylindrical matrix of said first thermosetting resin and said fibrous reinforcing material prior to the curing of said first thermosetting resin to thereby permit limited intermingling of said first and second thermosetting resins at their interface, and

applying heat to said mold while said mold is rotating to cure said first and second resins and to cross-link said first and second resins at their intermingled interface to thereby form an unreinforced inner lining of said second thermosetting resin for said pipe.

4,097,570

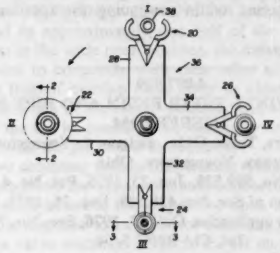
METHOD FOR MAKING PLASTIC ARTICLES

Andrew C. Dickson, and Robert F. Kontz, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 15, 1976, Ser. No. 677,095
Int. Cl.[2] B29C *17/02, 17/07*
U.S. Cl. 264—296 8 Claims

1. In a method of making a thermoplastic parison having an integral finish and an adjacent integral, annular supporting ring, the steps of: heating an end portion only of the parison to a deformable temperature; positioning the heated parison portion in a mold in general radial alignment with adjacent, annular, longitudinally spaced finish and supporting ring cavities; supporting one longitudinal end of the parison while axially displacing the other, remote parison end toward said one end to force at least a portion of the heated plastic material from

said heated end portion of the parison outwardly into at least one of the adjacent annular, longitudinally spaced cavities; and then supporting the other remote parison end while axially displacing said one parison end to force additional heated



plastic material from said heated end portion of the parison into at least the other of the adjacent, annular, longitudinally spaced cavities to complete the formation of the integral finish and adjacent supporting ring on the parison.

4,097,571

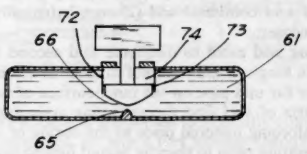
METHOD FOR PRODUCING A FOLDABLE PLASTIC STRIP

Bernard K. Cox, R.R. 5, Box 293, Connersville, Ind. 47331

Division of Ser. No. 655,518, Feb. 5, 1976. This application Oct. 27, 1976, Ser. No. 735,974

Int. Cl.[2] B29F *1/00*

U.S. Cl. 264—296 **5 Claims**



1. A method of forming with an injection mold a plastic piece with a living hinge, comprising the steps of:

providing a mold having a cavity with two immovable mutually opposed surfaces and with a rib projecting into the cavity from one surface of the opposed surfaces and a push bar slidably mounted in a channel and mutually opposed from the rib, the push bar projecting into the cavity from the other surface of the opposed surfaces;

injecting liquid plastic into the mold to only partially fill the cavity therein;

moving the push bar within the channel through a space extending at least one-half the distance across the cavity in the direction of the one surface and the projecting rib, said moving forcing the liquid plastic to flow opposite the direction of the push bar toward the other surface and to completely fill the remaining portion of the cavity surrounding the channel, said moving thereby forming mutually opposed and aligned grooves in the plastic; and

sealing the push bar relative to the channel to exclude the flow of liquid plastic behind the push bar and into the space through which the push bar travels during said moving.

4,097,572

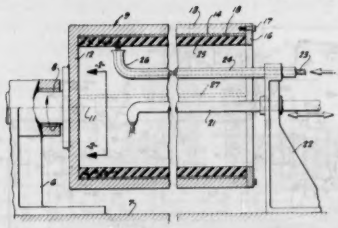
METHOD OF FORMING A TUBULAR CONTAINER

Grant W. Walker, Sacramento, Calif., assignor to Energy Absorption Systems, Inc., Chicago, Ill.

Filed Aug. 9, 1976, Ser. No. 712,848

Int. Cl.[2] B29C *5/04*; B29D *3/02*

U.S. Cl. 264—310 **2 Claims**



1. A method of forming a tubular container consisting of the steps of providing a drum rotatable about an axis and having a wall with an interior surface, disposing an axially split liner within said drum in contact with said wall surface, then rotating said drum and said liner in unison about said axis, then depositing a time-settable liquid matrix within said rotating liner to assume an annular shape and adding lengths of roving to said matrix while leaving the inner surface of said annular shape exposed to the air, then continuing rotation of said drum and liner and matrix and roving for a time until said matrix is at least partially set as a body able to maintain a stable annular shape, then stopping the rotation of said drum and liner and matrix and roving, then axially withdrawing said liner and said matrix and said roving in said maintained annular shape while continuing to leave the inner surface of said matrix exposed to the air, then slightly expanding and removing said liner from said matrix and said roving, and then replacing said removed liner in said drum.

4,097,573

METHOD FOR BENDING THERMOPLASTIC PIPES

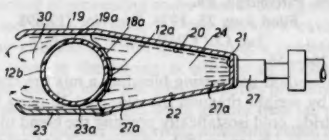
Gunnar Parmann, Mathopen, Norway, assignor to Rieber & Son A/S, Bergen, Norway

Continuation of Ser. No. 547,371, Feb. 6, 1975, abandoned, which is a division of Ser. No. 321,028, Jan. 4, 1973, Pat. No. 3,884,612. This application Aug. 25, 1976, Ser. No. 717,674

Claims priority, application Norway, Jan. 12, 1972, 48/72

Int. Cl.[2] B29C *17/02*

U.S. Cl. 264—322 **11 Claims**



1. A method of bending thermoplastic pipe comprising the steps of

locating one end of the pipe in a fixed position,

blowing a flow of heat-transfer medium from only one side of the pipe onto and around a circumferential surface of a portion of the pipe spaced from said end to heat a first peripheral pipe section facing said flow while guiding the heat transfer medium towards an opposite peripheral pipe section to heat said opposite peripheral pipe section to a lesser extent than said first section,

internally reinforcing said heated portion of the pipe during heating with a removable reinforcing means, and

bending said heated portion of the pipe.

8. A method of bending thermoplastic pipes comprising the steps of

introducing a thermoplastic pipe into a heat transfer means and simultaneously engaging at least one end of said pipe with a locating means in a fixed position externally of the heat transfer means,

introducing a means into the pipe for internally reinforcing the pipe,

blowing a heat transfer medium from only one side of the pipe initially as a pressurized flow against a circumferential surface of a portion of the pipe to effect a preliminary uniform heating of said circumferential surface and thereafter increasing the pressure of the heating medium to heat a first section of the periphery of the pipe within the heat transfer means to a maximum extent while causing a boundary layer of the flowing medium to be displaced at a location on the periphery of the pipe between said first section and a second section of the periphery of the pipe to thus cause an enhanced whirl effect immediately adjacent said second section whereby said second section is heated to a lesser extent than said first section,

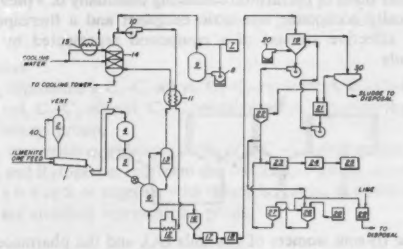
thereafter applying a bending force on the pipe, and

subsequently cooling the pipe after bending of the pipe is concluded.

4,097,574
PROCESS FOR PRODUCING A SYNTHETIC RUTILE FROM ILMENTITE

Robert G. Auger, Monroeville, and Edward F. Restelli, Jr., Oakmont, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jun. 16, 1976, Ser. No. 696,596
Int. Cl.[2] C01G *23/04, 49/06, 49/02*
U.S. Cl. 423—74 **12 Claims**



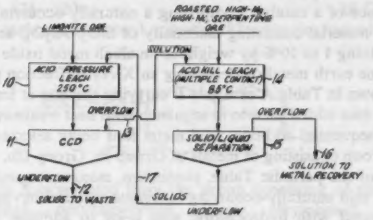
1. Method of processing ilmenite to produce a synthetic rutile comprising subjecting the ilmenite or a concentrate thereof to gaseous oxidizing conditions to oxidize FeO therein to Fe_2O_3, exposing the ilmenite to a hydrogen atmosphere in a fluidized bed at a temperature of at least 1400° F to reduce iron therein to a solubilized metallic state, cooling the ilmenite thus reduced to below 1000° F in a nonoxidizing atmosphere, and contacting the reduced product with an aerated aqueous leach solution to dissolve and oxidize iron therein to an insoluble iron oxide physically separable from said leach solution and from residual insoluble reduced ilmenite product consisting at least substantially of TiO_2.

3. Method of claim 1 in which the aeration-leached ilmenite is subjected to an acid leach to remove traces of metallic iron and other metal oxides.

4,097,575
ROAST-NEUTRALIZATION-LEACH TECHNIQUE FOR THE TREATMENT OF LATERITE ORE

Eddie C. J. Chou, Arvada; Craig B. Barlow, Wheatridge, and Dale K. Huggins, Arvada, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Nov. 5, 1976, Ser. No. 739,244
Int. Cl.[2] C01G *53/10*
U.S. Cl. 423—150 **12 Claims**



1. In a method of leaching a low-magnesium nickel-containing oxide ore, wherein an oxide ore containing by weight at least about 0.8% nickel and magnesium ranging up to about 5% is leached in a sulfuric acid solution at an elevated temperature exceeding about 150° C and an elevated pressure exceeding about 150 psig for a time sufficient to leach substantially the nickel therefrom and form a pregnant liquor thereof of pH less than about 1 and a leached residue, and wherein said pregnant liquor is neutralized by adding thereto a raw high-magnesium nickel-containing serpentine silicate ore containing at least about 0.8% nickel and over 5% magnesium while at the same time leaching nickel from said serpentine ore, the improvement of enhancing the neutralization capability of said raw high-magnesium ore which comprises,

subjecting said raw high-magnesium serpentine ore to an oxidizing roast prior to said neutralization step at a temperature below the temperature at which forsterite recrystallizes,

said roasting temperature being below 820° C,

subjecting said pregnant liquor to neutralization at atmospheric pressure and a temperature not exceeding about 100° C by adding thereto an amount of said roasted ore to raise the pH to above 2 while leaching nickel from said high-magnesium ore and provide a residue thereof,

the rate of neutralization with roasted ore being faster than the rate using unroasted ore,

separating said neutralized pregnant liquor from said high-magnesium residue for the recovery of nickel therefrom,

recycling said high-magnesium residue back into the leaching process for mixing with fresh low-magnesium ore for leaching at said elevated temperature and pressure,

leaching said fresh low-magnesium ore together with said high-magnesium residue at said temperature exceeding about 150° C and said pressure exceeding about 150 psig to form leached solids thereof and said pregnant liquor of pH less than about 1 which is thereafter neutralized with said roasted high-magnesium ore,

and disposing of said leached solids.

4,097,576

REDUCTION CATALYST FOR REMOVAL OF NITROGEN OXIDES IN EXHAUST GAS

Takaaki Tamura, Tokyo; Norihiko Fujita, Musashinoshi; Chihiro Matsuura, Tokyo; Wataru Ito, Hachiojishi, and Naoki Negishi, Tokyo, all of Japan, assignors to Kogyo Kaihatsu Kenkyusho (Industrial Research Institut), Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,833
Claims priority, application Japan, Mar. 8, 1975, 50-28408
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—239 A 4 Claims

1. A method for reducing the NO_x in an NO_x containing exhaust gas which comprises: contacting said NO_x-containing exhaust gas with NH_3 in a mol ratio of NH_3:NO_x of from about 0.8 : 1 to 2 : 1 at a temperature of above about 200° C and at a space velocity of from about 10,000 to about 15,000 hr^{-1} in the presence of a catalyst comprising a naturally-occurring inorganic material consisting essentially of SiO_2, Al_2O_3, and H_2O containing 1 to 10% by weight of an alkali metal oxide and an alkaline earth metal oxide having an X-ray diffraction pattern as shown in Table A or Table B carrying thereon at least two metal ions added thereto in sequence with heat treatment after each sequential addition, said metal ions being selected from the group consisting of metals of Group Ib, Group IIb, Group VIII of the periodic Table, chromium, manganese and vanadium, said naturally-occurring inorganic material having been pretreated with hydrochloric acid prior to addition of said metal ions.

4,097,577

METHOD OF LOWERING INTRAOCULAR PRESSURE WITH ANTAZOLINE

Harry Salem, Elkins Park, and Domingo M. Aviado, Wynnewood, both of Pa., assignors to Cooper Laboratories, Incorporated, Parsippany, N.J.

Filed Aug. 12, 1976, Ser. No. 713,805
Int. Cl.[2] A01N *9/22*
U.S. Cl. 424—273 R 3 Claims

1. A method for reducing intraocular pressure in mammals having intraocular hypertension comprising topically administering to a mammilian eye an effective amount for reducing intraocular pressure of a composition comprising antazoline phosphate and a non-toxic, pharmaceutically acceptable, ophthalmological carrier.

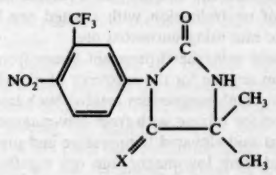
4,097,578

1-(3'-TRIFLUOROMETHYL-4'-NITROPHENYL)-4,4-DIMETHYL IMIDAZOLIDINES

Jacques Perronnet; Pierre Girault, both of Paris, and Claude Bonne, Bry-sur-Marne, all of France, assignors to Roussel Uclaf, Paris, France

Filed Oct. 21, 1976, Ser. No. 734,557
Claims priority, application France, Oct. 29, 1975, 75 33084
Int. Cl.[2] A61K *31/415;* C07D *233/72, 233/88*
U.S. Cl. 424—273 R 7 Claims

1. A compound of the formula



wherein X is selected from the group consisting of oxygen and imine.

5. A method of inducing antiandrogenic activity in warm-blooded animals comprising administering to warm-blooded animals an antiandrogenically effective amount of claim 1.

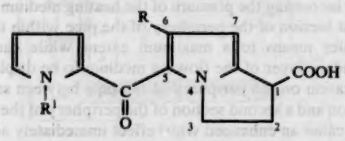
4,097,579

5-(2-PYRROYL)-1,2-DIHYDRO-3H-PYRROLO[1,2-a]PYRROLE-1-CARBOXYLIC ACID DERIVATIVES AND PROCESS FOR THE PRODUCTION THEREOF

Joseph Martin Muchowski, Sunnyvale, and Arthur Frederick Kluge, Los Altos, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

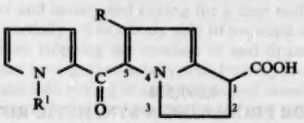
Filed Mar. 31, 1977, Ser. No. 783,090
Int. Cl.[2] C07D *487/04;* A61K *31/40*
U.S. Cl. 424—274 24 Claims

1. A compound selected from the group of those represented by the formula



and the individual (l)-acid and (d)-acid isomers thereof and the pharmaceutically acceptable, non-toxic alkyl esters having from one to twelve carbon atoms and salts thereof, wherein each of R and R^1 is independently hydrogen or a lower alkyl group having from 1 to 4 carbon atoms.

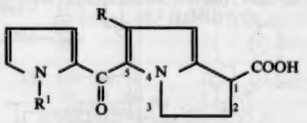
18. A composition for treating inflammation, pain or pyrexia in mammals consisting essentially of a pharmaceutically acceptable non-toxic excipient and a therapeutically effective amount of a compound represented by the formula



(A)

or the (l)-acid isomers of Formula (A), and the pharmaceutically acceptable, non-toxic alkyl esters having from one to twelve carbon atoms and salts thereof, wherein each of R and R^1 is independently hydrogen or a lower alkyl group having from 1 to 4 carbon atoms.

20. A composition for administration to a pregnant mammal to delay onset of parturition consisting essentially of a pharmaceutically acceptable non-toxic excipient and a thereapeutically effective amount of a compound represented by the formula



(A)

or the (l)-acid isomers of Formula (A), and the pharmaceutically acceptable, non-toxic alkyl esters having from one to twelve carbon atoms and salts thereof, wherein each of R and R^1 is independently hydrogen or a lower alkyl group having from 1 to 4 carbon atoms.

4,097,580

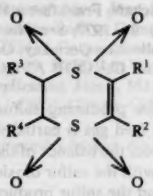
2,3-DIHYDRO-1,4-DITHIIN 1,1,4,4-TETROXIDE ANTIMICROBIALS

Arthur D. Brewer, Puslinch, Canada, and Robert A. Davis, Cheshire, Conn., assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Guelph, Canada

Division of Ser. No. 481,010, Jun. 20, 1974, Pat. No. 4,004,018.
This application Nov. 18, 1976, Ser. No. 742,933
Int. Cl.[2] A01N *9/00*
U.S. Cl. 424—277 10 Claims

1. A method of controlling viruses comprising contacting

said viruses with a viricidally effective amount of a 2,3-dihydro-1,4-dithiin 1,1,4-tetrooxide having the following structural formula:



wherein R_1, R_2, R_3, and R_4 are independently hydrogen, alkyl having 1 to 14 carbon atoms, aryl, aryl substituted with one to three substituents selected from the group consisting of lower alkyl, halogen, lower alkoxy, nitro, and aryl, alkoxymethyl wherein the alkyl group contains 1 to 8 carbon atoms, aryloxymethyl, alkylaminomethyl wherein the alkyl group contains 1 to 8 carbon atoms, or adjacent R's may be joined together as a chain of 3 to 4 methylene groups.

4,097,581

DIOXOLANE DERIVATIVES

Saleem Farooq, Aesch, and Friedrich Karrer, Zofingen, both of Switzerland, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

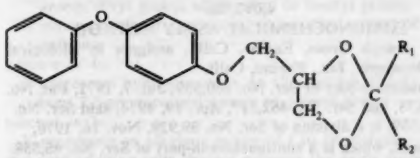
Filed Dec. 7, 1976, Ser. No. 748,783

Claims priority, application Switzerland, Dec. 12, 1975, 16153/75; Dec. 24, 1975, 16783/75; Sep. 1, 1976, 11069/76; Nov. 19, 1976, 14584/76

Int. Cl.² A61K *31/335;* **C07D** *317/10;* **A01N** *9/28*

U.S. Cl. 424—278 **18 Claims**

1. A compound of the formula I



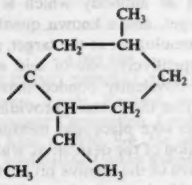
(I),

wherein

R_1 represents a C_1–C_7-alkyl, C_3–C_6-cycloalkyl, C_2–C_3-alkenyl, C_2–C_3-alkinyl, C_2–C_4-methoxyalkyl, chloromethyl or benzyl group,

R_2 represents a hydrogen atom or a C_1–C_6-alkyl group, or

R_1 and R_2 together represent the $-(CH_2)_n-$ group, in which n is 4 or 5, or together with the carbon atom to which they are attached represent the group



15. An insecticidal and acaricidal composition comprising as active ingredient an insecticidally and acaricidally effective amount of a compound of the formula I according to claim 1 together with a suitable carrier therefor.

16. A method of controlling insects and acarids which are harmful to animals and plants, which comprises applying to the locus thereof an insecticidally and acaricidally effective amount of at least one compound of the formula I according to claim 1.

4,097,582

6',2-(2'-ARYLCHROMONYL) PROPIONIC ACIDS, AND ANALGESIC AND ANTI-INFLAMMATORY DERIVATIVES THEREOF

Philippe Briet; Jean-Jacques Berthelon; Jean-Claude Depin, all of Lyon, and Eugéne Boschetti, Venissieux, all of France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyon, France

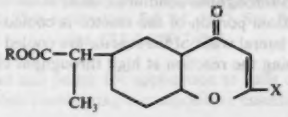
Filed Nov. 12, 1975, Ser. No. 631,401

Claims priority, application France, Nov. 20, 1974, 74 38080, Oct. 10, 1974 France 75 31024

Int. Cl.² A61K *31/35;* **C07D** *311/02, 295/00*

U.S. Cl. 424—283 **10 Claims**

1. A carboxychromonyl compound having the formula



in which X is selected from the group consisting of phenyl, halophenyl, polyhalophenyl, lower alkylphenyl, and trihalomethylphenyl; and R is selected from the group consisting of hydrogen, lower alkyl, lower omega-hydroxyalkyl, morpholinoethyl and lower dialkylaminoalkyl, together with (a) salts of said compound with pharmaceutically acceptable acids when R is morpholinoethyl and lower dialkylaminoalkyl and (b) salts of said compound with pharmaceutically acceptable mineral and organic bases when R is hydrogen.

8. An analgesic and anti-inflammatory pharmaceutical composition which comprises (a) the carboxychromonyl compound claimed in claim 4 in an amount sufficient to provide analgesic and anti-inflammatory activity together with (b) a pharmaceutically acceptable diluent therefor.

4,097,583

PROCESS FOR THE PRODUCTION OF PHOSPHORUS PENTASULFIDE

Hermann Niermann, Erftstadt Bliesheim, and Franz Mainzer, Hurth, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 657,548, Feb. 12, 1976, abandoned, which is a continuation of Ser. No. 480,353, Jun. 18, 1974, abandoned. This application Mar. 14, 1977, Ser. No. 777,451

Claims priority, application Germany, Sep. 19, 1973, 2347062

Int. Cl.² C01B *25/14*

U.S. Cl. 423—303 **3 Claims**

1. In the process for the manufacture of phosphorus sulfides by reacting phosphorus with sulfur at elevated temperatures in a reaction zone surrounded by a heat exchanging material which receives and controls the reaction heat, which comprises maintaining in the reaction zone by heating and cooling, respectively, a temperature below the boiling and above the solidification point of the reaction mixture by causing a gas stream having the temperature necessary for heating and cooling, respectively, to flow around the reaction zone, conducting the gas stream so as to permit reversing the reaction zone substantially instantaneously from heating to cooling and vice versa, the gas stream for cooling being suction drawn past the reaction zone to create a sub-pressure with respect to the interior of the reaction zone for preventing the gas from penetrating the reaction zone whereby any liquid phosphorus sulfide escaping from the reaction zone is immediately solidified in the presence of the gas stream flowing around the reaction zone at a high velocity of flow, and the gas stream for heating comprising combustion and off-gases, being free from oxygen and originating from a mixture of a combustible and air, the improvement wherein the heat exchange in the bottom portion

of the reactor is effected by means of a system actuated and operated separately and independently from the heat exchange system surrounding the lateral walls of the reactor whereby the resulting formation of a final product is obtained which is homogeneous and contains as little as one to two ppm. of iron in comparison to much more ppm. of iron contaminent are obtained by the same reaction in a reactor which is the same as previously described, except that the heat exchange in the bottom portion is not effected by means of a heat exchange system which is actuated and operated separately and independently from the heat exchange system surrounding the lateral walls of the reactor; and whereby:

(a) the lateral walls of the reactor are heated by means of hot combustion gas for performing the reaction at low throughput conditions;

(b) both the bottom portion and the lateral walls of the reactor are cooled with air for performing the reaction at standard throughput conditions; and

(c) the bottom portion of the reactor is cooled with water and the lateral walls of the reactor are cooled with air for performing the reaction at high throughput conditions.

4,097,584

METHOD OF PRODUCING SILICON USEFUL FOR SEMICONDUCTOR COMPONENT MANUFACTURE

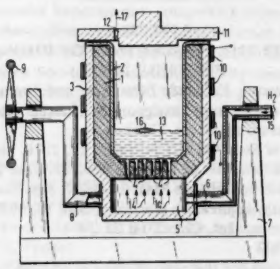
Konrad Reuschel, Vaterstetten, and Norbert Schink, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 19, 1977, Ser. No. 798,442

Claims priority, application Germany, May 25, 1976, 2623413

Int. Cl.[2] C01B *33/02, 35/08, 35/10, 25/06*

U.S. Cl. 423—348 **4 Claims**



1. A method of producing silicon having a boron and phosphorous content of less than 1 ppm so that such silicon can be utilized for manufacture of silicon components, comprising:

confining technical-grade silicon in a reaction chamber heated to a temperature in the range of 1420° to 1480° C. so as to produce a silicon melt within said chamber, said technical-grade silicon having an amount of boron and phosphorous therein greater than 1 ppm; and

providing a stream of hydrogen-containing gas having at least 0.1% water vapor, at least 1% hydrogen and an inert gas therein and controllably passing said stream through said silicon melt within the reaction chamber so that an amount of phosphorous escapes from such silicon melt as gaseous phosphorus hydrogen compound and is removed from said melt via exhaust gases from said reaction chamber and an amount of boron escapes from such silicon melt as boron oxide and is removed from said melt in a slag that forms on top of said silicon melt, which slag is removed.

4,097,585

PRODUCTION OF SULFUR FROM CLAUS PROCESS WASTE GAS

Herbert Fischer, Lollar, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sep. 26, 1977, Ser. No. 836,464

Claims priority, application Germany, Oct. 25, 1976, 2648190

Int. Cl.[2] C01B *17/04*

U.S. Cl. 423—574 R **10 Claims**

1. In the process for producing sulfur wherein hydrogen sulfide contained in a feed gas is partially combusted to form sulfur and sulfur dioxide, the balance of the hydrogen sulfide is catalytically reacted with the sulfur dioxide at a low temperature to form sulfur, and the sulfur produced is separated from the residual exhaust gas, the improvement which comprises

(a) catalytically hydrogenating the residual exhaust gas with a hydrogen containing gas to form hydrogen sulfide from the sulfur and residual sulfur in such exhaust gas;

(b) simultaneously with step (a) catalytically hydrolyzing the carbon oxysulfide and carbon disulfide contained in the exhaust gas with steam to form hydrogen sulfide;

(c) oxidizing part of at least one of the hydrogen sulfide contained in the initial feed gas and the ultimate sulfur product with air in stoichiometric or slightly less amount to form sulfur dioxide;

(d) adding the sulfur dioxide produced in step (c) to the hydrogen sulfide-containing exhaust gas which has been subjected to steps (a) and (b) in an amount to establish a ratio of hydrogen sulfide to sulfur dioxide of about 2 : 1;

(e) catalytically reacting the hydrogen sulfide still contained in the exhaust gas after step (d) with sulfur dioxide at about 100° to 150° C to form sulfur, and recovering the sulfur; and

(f) regenerating the catalyst with an oxygen-free hot gas containing hydrogen sulfide.

4,097,586

IMMUNOCHEMICAL ASSAY METHOD

Stanley Joseph Gross, Encino, Calif., assignor to Biological Developments, Inc., Encino, Calif.

Continuation-in-part of Ser. No. 160,559, Jul. 7, 1971, Pat. No. 3,940,475, and Ser. No. 462,517, Apr. 19, 1974, said Ser. No. 160,559, is a division of Ser. No. 89,929, Nov. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 45,558, Jul. 11, 1970, abandoned, said Ser. No. 462,517, is a continuation-in-part of said Ser. No. 89,929, which is a continuation-in-part of said Ser. No. 45,558. This application Feb. 17, 1976, Ser. No. 658,180

The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.

Int. Cl.[2] A61K *43/00;* **G01N** *33/00, 33/16*

U.S. Cl. 424—1 **22 Claims**

1. In a quantitative immunoassay for the presence of a target in a sample comprising producing a mixture of the sample, a known quantity of an antibody which is immunologically specific for the target, and a known quantity of a standard immunologically homologous to the target, so as to bind with said antibody competitively, one of said antibody and said standard having a covalently bonded derivative capable of emitting radiation from the mixture, providing for competitive antibody binding to take place and measuring the radiation emitted from a portion of the derivative, which radiation measurement is indicative of the relative proportions of target and standard binding with the antibody, and thus the amount of target present, the improvement comprising employing as the antibody, antibody raised by and specific to the hapten portion of a synthetic antigen comprising a plurality of hapten moieties covalently bound to a carrier, said moieties being immunologically homologous with the target and the hapten being bound by a —N=N— group coupled directly to an otherwise unsubstituted ring atom of the hapten.

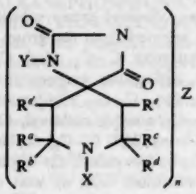
4,097,587
1,3,8-TRIAZASPIRO[4.5]DECANE-2,4-DIONE POLYMER STABILIZERS

Nobuo Soma; Tomoyuki Kurumada, both of Tokyo, Japan; Heimo Brunetti, Reinach, and Jean Rody, Basel, both of Switzerland, assignors to Sankyo Company, Limited, Tokyo, Japan and CIBA-GEIGY Corporation, Ardsley, N.Y.

Filed May 19, 1976, Ser. No. 687,794
Claims priority, application Japan, May 28, 1975, 50-63851
Int. Cl.[2] C07D *471/10;* C08K *5/34*
U.S. Cl. 260—45.8 A 14 Claims

1. A piperidine compound having the formula (I):

(I)



wherein
R^a represents methyl group;
R^b represents ethyl group;
R^c represents an alkyl group of 1 to 5 carbons;
R^d represents ethyl group;
or
R^c and R^d, together with the carbon atom to which they are attached, represent a cycloalkyl group of 5 to 7 carbons;
one of R^e and $R^{e'}$ represents hydrogen atom and the other of R^e and $R^{e'}$ represents a lower alkyl group of 1 to 4 carbons or an allyl group;
n is 1 or 2;
Y represents hydrogen atom or, when neither X nor Z represents hydrogen atom, Y represents hydrogen methyl group, ethyl group, allyl group or benzyl group;
X represents hydrogen atom, or an alkyl group of 1 to 4 carbons;
when $n = 1$:
Z represents hydrogen atom, an alkyl group of 1 to 18 carbons 2,3-epoxypropyl group, or phenyl group
when $n = 2$:
X represents an alkylene group of 1 to 10 carbons
and acid addition salts thereof wherein the acids are selected from the group consisting of sulphuric acid, hydrochloric acid or phosphoric acid; formic acid, acetic acid, valeric acid, stearic acid, oxalic acid, adipic acid, sebacic acid, maleic acid, benzoic acid, p-t-butylbenzoic acid, 4-hydroxy-3,5-di-t-butylbenzoic acid, salicylic acid or terephthalic acid; methanesulphonic acid or p-toluene-sulphonic acid; or phenylphosphonic acid.

4. A polymer composition stabilized against photo- and thermal-deterioration thereof wherein there is incorporated, in an amount sufficient to prevent said deterioration, a piperidine of claim 1.

4,097,588
MINERALIZING DENTAL MOUTHRINSE

Ronnie Stuart Levine, Leeds, England, assignor to National Research Development Corporation, London, England

Filed Mar. 8, 1976, Ser. No. 664,439
Claims priority, application United Kingdom, Mar. 11, 1975, 10044/75
Int. Cl.[2] A61K *7/18*
U.S. Cl. 424—52 21 Claims

1. A mouthrinse composition saturated with respect to brushite, said composition being in the form of a clear solution and wherein said composition has been prepared by adding solid brushite to water to provide a solution containing excess solid brushite at a temperature of from 0° to 15° C., separating said solution from excess brushite to provide a clear solution, and allowing said clear solution to come to an ambient temperature greater than 15° C.

4,097,589
NAIL POLISH

Albert Shansky, Norwalk, Conn., assignor to Del Laboratories, Inc., Farmingdale, N.Y.

Continuation-in-part of Ser. No. 654,153, Feb. 2, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,439
Int. Cl.[2] A61K *7/043*
U.S. Cl. 424—61 2 Claims

1. A liquid nail polish for application to nails on a human, said nail polish constituting a composition essentially consisting of:
(A) nitrocellulose,
(B) a mixture of solvents for nitrocellulose comprising ethyl acetate, butyl acetate, toluene and butyl alcohol,
(C) a terpolymer of
(i) laurolactam,
(ii) caprolactam, and
(iii) hexamethylene diamine adipate,
(iv) in equimolecular proportions,
(D) a solvent for said terpolyer, comprising trichloroethane and ethyl alcohol,
(E) the nitrocellulose and the terpolymer being dissolved in the solvents for the nitrocellulose and for the said terpolymer,
(F) the dissolved terpolymer initially being of a particle size less than 80 microns,
(G) said dissolved terpolymer being present in an amount in the nail polish of from between 0.001% to 0.1% by weight of the composition which is effective to impart to the nails an improved flexural strength when the composition is applied as a coating thereon and permitted to dry.

4,097,590
METHODS AND COMPOSITIONS FOR TREATMENT OF BACTERIAL AND FUNGUS INFECTIONS OF THE SKIN

Geraldine Fay Weisz, 2240 Harmain Rd., Pittsburgh, Pa. 15235

Continuation-in-part of Ser. No. 598,635, Jul. 24, 1975, Pat. No. 3,996,350, which is a continuation-in-part of Ser. No. 537,969, Jan. 2, 1975, Pat. No. 3,995,029. This application Jul. 19, 1976, Ser. No. 706,444
The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.
Int. Cl.[2] A01N *11/00;* C11D *3/48, 9/50*
U.S. Cl. 424—151 9 Claims

1. A composition for treating bacterial and fungus infections of the skin such as acne vulgaris and athlete's foot comprising a mixture of about 0.05% to 1% of a wetting agent and the balance a water soluble fluoride.

4,097,591

N^2-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Machida; Yoshikuni Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of, Japan

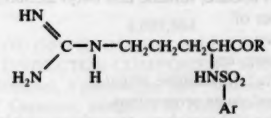
Continuation-in-part of Ser. No. 760,677, Jan. 19, 1977, which is a continuation-in-part of Ser. No. 638,985, Dec. 9, 1975, Pat. No. 4,055,636, Ser. No. 646,522, Jan. 5, 1976, Pat. No. 4,018,915, Ser. No. 649,219, Jan. 14, 1976, Pat. No. 4,018,913, Ser. No. 656,014, Feb. 6, 1976, Pat. No. 4,041,156, Ser. No. 656,870, Feb. 10, 1976, Pat. No. 4,046,876, Ser. No. 669,743, Mar. 24, 1976, Pat. No. 4,070,457, Ser. No. 671,436, Mar. 29, 1976, Pat. No. 4,066,758, and Ser. No. 703,704, Jul. 8, 1976, Pat. No. 4,069,323, said Ser. No. 671,436, is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Mar. 10, 1977, Ser. No. 776,195

The portion of the term of this patent subsequent to Jan. 3, 1995, has been disclaimed.

Int. Cl.[2] A61K *37/00*; C07C *103/52*

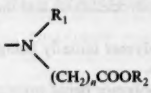
U.S. Cl. 424—177 3 Claims

1. An N^2-arylsulfonyl-L-argininamide having the formula (I)



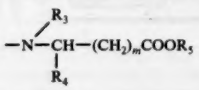
(I)

or a pharmeceutically acceptable salt thereof, wherein R is



(I)

wherein R_1 is C_2–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_2–C_{10} alkoxyalkyl, C_2–C_{10} alkylthioalkyl, C_2–C_{10} alkylsulfinylalkyl, C_1–C_{10} hydroxyalkyl, C_2–C_{10} carboxyalkyl, C_3–C_{10} alkoxycarbonylalkyl, C_1–C_{10} haloalkyl, C_7–C_{15} aralkyl, C_8–C_{15} α-carboxyaralkyl, C_3–C_{10} cycloalkyl or C_4–C_{10} cycloalkyl; R_2 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and *n* is an integer of 1,2 or 3; or



(2)

wherein R_3 is hydrogen, C_1–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_2–C_{10} alkoxyalkyl, C_2–C_{10} alkylthioalkyl, C_2–C_{10} alkylsulfinylalkyl, C_1–C_{10} hydroxyalkyl C_2–C_{10} carboxyalkyl, C_3–C_{10} alkoxycarbonylalkyl, C_1–C_{10} haloalkyl, C_7–C_{15} aralkyl, C_8–C_{15} α-carboxyaralkyl, C_3–C_{10} cycloalkyl or C_4–C_{10} cycloalkylalkyl; R_4 is C_1–C_5 alkyl, carboxy, C_2–C_{10} alkoxycarbonyl, phenyl, C_7–C_{12} aralkyl or ring substituted benzyl wherein said substituent is C_1–C_5 alkyl or C_1–C_5 alkoxy; R_5 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and *m* is an integer of 0, 1 or 2;

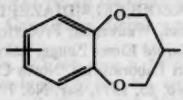
Ar is a phenyl or naphthyl group, either substituted with at least one substituent selected from the group consisting of sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamonyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxy, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy, or mixtures thereof;

a phenyl or naphthyl group, either substituted with at least one substituent selected from the group consisting of sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamonyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxy, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy, or mixutres thereof, and at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy and C_2–C_{20} dialkylamino;

an oxanthrenyl or dibenzofuranyl group substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl, and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy, or mixtures thereof;

a C_7–C_{12} aralkyl, tetrahydronaphthyl, 1,2-ethylenedioxyphenyl, chromanyl, 2,3-ethylenedioxynaphthyl or xanthenyl group, any substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamonyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl, oxo and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy, or mixtures thereof; a naphthoquinonyl, anthryl, phenanthryl, pentalenyl, heptalenyl, azulenyl, biphenylenyl, as-indacenyl, S-indacenyl, acenaphthylenyl, phenylcarbonylphenyl, phenoxyphenyl, benzofuranyl, isobenzofuranyl, benzo (b) thienyl, isobenzothienyl, thianthrenyl, dibenzothienyl, phenoxathiinyl, indolyl, 1H-indazolyl, quinolyl, isoquinolyl, phthalazinyl, 1,8-naphthridinyl, quinoxalinyl, quinazolinyl, cinnolinyl, carbazolyl, acridinyl, phenazinyl, phenothiazinyl, phenoxazinyl or benzimidazolyl group any of which is unsubstituted or substituted with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy, or mixtures thereof;

a C_9–C_{16} cycloalkylphenyl, C_{10}–C_{18} cycloalkylalkylphenyl, C_9–C_{16} cycloalkyloxyphenyl, C_9–C_{16} cycloalkylthiophenyl, 9,10-dihydroanthryl, 5,6,7,8-tetrahydroanthryl, 9,10-dihydrophenanthryl, 1,2,3,4,5,6,7,8-octahydrophenanthryl, indenyl, indanyl, fluorenyl, acenaphthenyl, phenylthiophenyl, isochromanyl, 2,3-dihydrobenzofuranyl, 1,3-dihydroisobenzofuranyl, thioxanthenyl, 2H-chromenyl, 3,4-dehydro-1-isochromanyl, 4H-chromenyl, indolinyl, isoindolinyl, 1,2, 3,4-tetrahydroquinolyl or 1,2,3,4-tetrahydroisoquinolyl group any of which is unsubstituted or substituted with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10}hydroxyalkyl, C_1–C_{10} haloalkyl, oxo and phenyl optionally substituted with at least one hydroxyl, C_1–C_5 alkoxy, or mixtures thereof; or benzene ring-substituted



wherein R_6 is hydrogen, C_1–C_{10} alkyl or C_1–C_{10} alkoxy, and said substituent is at least one C_1–C_5 alkoxy or mixtures thereof.

4,097,592

O-[1-SUBSTITUTED-6-PYRIDAZINON(3)YL]-THIONOALKANEPHOSPHONIC ACID ESTERS FOR COMBATING INSECTS AND ACARIDS

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel; Lothar Rohe; Rolf Schröder, all of Wuppertal; Ingeborg Hammann, Cologne; Wolfgang Behrenz, Overath-Steinenbrueck, and Bernhard Homeyer, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

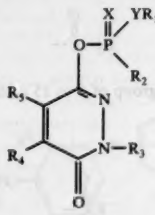
Filed Jul. 26, 1976, Ser. No. 708,669

Claims priority, application Germany, Aug. 5, 1975, 2534893

Int. Cl.[2] C07F 9/65; A01N 9/36

U.S. Cl. 424—200 **10 Claims**

1. An O-[1-substituted-6-pyridazinon(3)yl](thiono)(thiol)-alkanephosphonic acid ester of the formula



in which

R_1 and R_2 each independently is alkyl with 1 to 7 carbon atoms,

R_3 is alkyl, cyanoalkyl, alkylcarbonylalkyl, carbalkoxyalkyl, hydroxyalkyl, alkylthioalkyl or halogenoalkyl with 1 to 4 carbon atoms per alkyl radical, alkenyl or alkenyl with 3 to 5 carbon atoms, benzyl, benzyl carrying at least one substituent selected from halogen and alkyl with 1 to 3 carbon atoms, or phenyl, phenyl carrying at least one substituent selected from nitro, halogen, alkyl with 1 to 3 carbon atoms and carbalkoxy with 1 to 4 carbon atoms, or piperidinomethyl,

R_4 and R_5 each independently is hydrogen or alkyl with 1 to 3 carbon atoms, and

X and Y each independently is oxygen or sulfur.

9. A method of combating insects or acarids which comprises applying to the insects or acarids or to a habitat thereof an insecticidally or acaricidally effective amount of an ester according to claim 1.

4,097,593

O-ALKYL-S-[1,6-DIHYDRO-6-THIOXO-PYRIDAZIN-(1)-YL METHYL]-(THIONO)-(DI)-THIOL-PHOSPHORIC (PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES AND NEMATICIDAL, INSECTICIDAL AND ACARICIDAL COMPOSITIONS THEREOF

Fritz Maurer; Hans-Jochem Riebel, both of Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

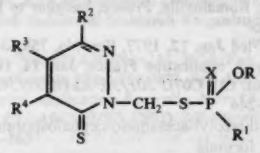
Filed Jan. 10, 1977, Ser. No. 758,242

Claims priority, application Germany, Jan. 28, 1976, 2603052

Int. Cl.[2] C07F 9/65; A01N 9/36

U.S. Cl. 424—200 **9 Claims**

1. An O-alkyl-S-[1,6-dihydro-6-thioxo-pyridazin-(1)-ylmethyl]-(thiono)-(di)-thiol-phosphoric(phosphonic) acid ester or ester-amide of the formula



in which

R is alkyl with 1 to 6 carbon atoms,

R^1 is alkyl, alkoxy, alkylmercapto or alkylamino with a maximum of 6 carbon atoms per alkyl chain,

R^2 is halogen, alkoxy with 1 to 5 carbon atoms or alkyl with 1 to 5 carbon atoms,

R^3 and R^4 each is hydrogen or conjointly form a fused benzene ring, and

X is an oxygen or sulfur atom.

8. A method of combating nematodes or insects and acarids which comprises applying to the nematodes or insects and acarids or to a habitat thereof a nematicidally or insecticidally or acaricidally effective amount of a compound according to claim 1.

4,097,594

MONO-5-SUBSTITUTED-3-CHLORO-4H-1,2,6-THIADIAZIN-4-ONE ANTIFUNGAL AGENTS

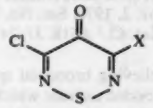
Clinton Joseph Peake; Wayne Nelson Harnish, both of Medina, and Bruce Lloyd Davidson, Middleport, all of N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 30, 1977, Ser. No. 782,860

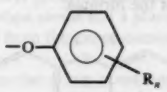
Int. Cl.[2] A01N 9/12

U.S. Cl. 424—246 **5 Claims**

1. A method for control of fungal disease on plants comprising applying to the locus where control is desired an effective fungistatic or fungicidal amount of a compound having the formula:



in which X is halogen, phenoxy, naphthoxy or substituted phenoxy having the formula



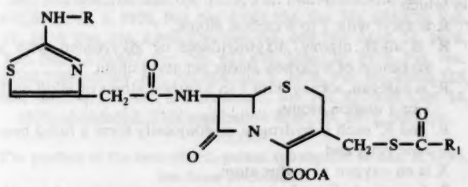
wherein each R group is a substituent independently selected from the group consisting of lower alkyl, halo, hydroxy, lower alkoxy, nitro, cyano, amino, carboxyl, lower acyl, lower acylamino having 1-4 carbon atoms, lower alkoxycarbonyl, carboxy(lower)alkyl, lower alkylureido, phenylureido, trihalomethyl, cyano(lower)alkyl, phenyl(lower)alkoxycarbonyloxy, lower alkylaminocarbonyloxy, phenylaminocarbonyloxy, lower alkylthio, lower alkylsulfinyl and lower alkylsulfonyl, and wherein *n* has a value of 1 to 3 inclusive, except when each R is halogen, *n* has a value of 1 to 5 inclusive.

4,097,595
7-AMINO-THIAZOLYL ACETAMIDO CEPHALOSPORANIC ACIDS

René Heymés, Romainville, France, assignor to Roussel Uclaf, Paris, France

Filed Jan. 12, 1977, Ser. No. 758,634
Claims priority, application France, Jan. 14, 1976, 76 00843
Int. Cl.[2] C07D *501/36;* A61K *31/545*
U.S. Cl. 424—246 15 Claims

1. 7-amino-thiazolyl-acetamido-cephalosporanic acid compounds of the formula



wherein R is selected from the group consisting of hydrogen, tert.-butoxy carbonyl, trityl, benzyl, dibenzyl, trichloroethyl, carbobenzyloxy, formyl and phthaloxy, R_1 is selected from the group consisting of alkyl of 1 to 4 carbon atoms, furyl, thiazolyl, oxothiazolinyl, isothiazolyl, oxazolyl, imidazolyl, diazolyl, thiadiazolyl and tetrazolyl, and A is selected from the group consisting of hydrogen, alkali metal and equivalents of alkaline earth metals, magnesium and a non-toxic, pharmaceutically acceptable organic amine.

12. A method of combatting bacterial infections in warm-blooded animals comprising administering to warm-blooded animals an antibacterially effective amount of at least one compound of claim 1.

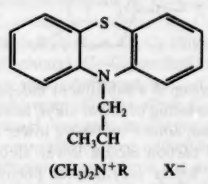
4,097,596
INHALATION THERAPY FOR RELIEVING BRONCHIAL SPASM USING QUATERNARY SALTS OF PROMETHAZINE

Albert J. Begany, Tucson, Ariz.; Marvin E. Rosenthale, Havertown, and Alphonse Dervinis, Wayne, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 2, 1976, Ser. No. 737,927
Int. Cl.[2] A61K *31/54*
U.S. Cl. 424—247 16 Claims

1. A method of relieving bronchial spasm and facilitating breathing in warm-blooded animals which comprises administering orally or nasally to a warm-blooded animal in need thereof, by aerosol route, an amount sufficient to relieve bronchial spasm and facilitate breathing in said warm-blooded animal of a composition comprising:

(a) a compound of the formula:



wherein R is cyclopropylmethyl or alkyl of from 1 to 4 carbon atoms; X is a pharmacologically acceptable anion; and

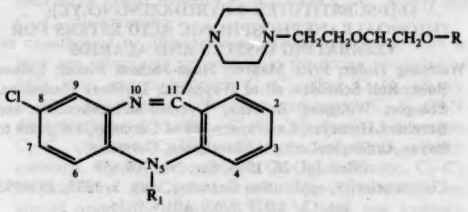
(b) a pharmacologically acceptable carrier.

4,097,597
DIBENZO[B,E][1,4]DIAZEPINES

Bruce Wayne Horrom, Waukegan; Frederick Nelson Minard, Lake Bluff, and Harold Elmer Zaugg, Lake Forest, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 23, 1977, Ser. No. 771,216
Int. Cl.[2] A61K *31/55;* C07D *403/04*
U.S. Cl. 424—250 18 Claims

1. A compound of the structure

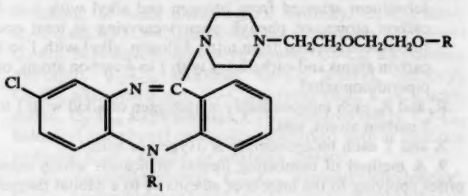


wherein R is H, loweralkyl, hydroxyloweralkyl or

where R_2 is an alkyl group of 1 to 15 carbon atoms; and R_1 is H or

where R_2 is an alkyl group of 1 to 15 carbon atoms.

7. A composition of long lasting activity in the treatment of schizophrenics comprising as the active component a compound of the formula



wherein R is H, loweralkyl, hydroxyloweralkyl or

where R_2 is an alkyl group of 1 to 15 carbon atoms; R_1 is H or

where R_2 is alkyl of 1 to 15 carbon atoms and a pharmaceutically acceptable carrier.

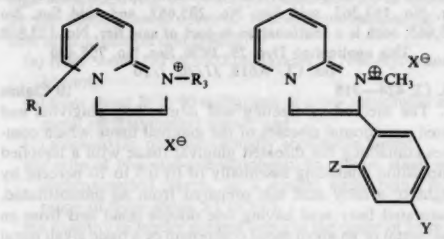
4,097,598

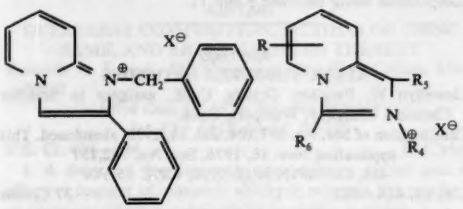
QUATERNARY SALTS AS HYPOGLYCEMIC AGENTS

Donald E. Kuhla, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

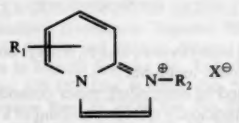
Division of Ser. No. 712,204, Aug. 6, 1976, Pat. No. 4,044,015, and a continuation-in-part of Ser. No. 609,914, Sep. 3, 1975, abandoned. This application Aug. 8, 1977, Ser. No. 822,746
Int. Cl.[2] A61K *31/435, 31/47*
U.S. Cl. 424—256 31 Claims

1. A method for reducing the blood-sugar level of a diabetic mammal which comprises orally or parenterally administering to said mammal a hypoglycemic amount of a compound of the formulae





and



wherein R is hydrogen or the carbon and hydrogen atoms completing a fused 6,7-benzo moiety; R_1 is hydrogen, chlorine, methoxy or benzyloxy; R_2 is furfuryl or 8-quinolylmethyl; R_3 is benzyl, α-naphthylmethyl, β-naphthylmethyl, β-phenethyl or substituted benzyl wherein the substituent is chloro, fluoro, bromo, dichloro, trifluoromethyl, cyano, methylsulfonyl, sulfamoyl, dimethylsulfamoyl, carbethoxy, phenyl or methoxy; R_4 is selected from the group consisting of alkyl having one to three carbon atoms, benzyl and substituted benzyl wherein said substituents are selected from the group consisting of chloro and dichloro; R_5 and R_6 are each selected from the group consisting of phenyl and hydrogen, provided that when R_5 and R_6 are each hydrogen, R_4 is selected from the group consisting of benzyl and substituted benzyl wherein said substituent is selected from the group consisting of chloro and dichloro; X is a pharmaceutically acceptable anion; Y is chlorine, bromine, hydrogen or methoxy; and Z is hydrogen or chlorine.

4,097,599

TRIAZOLES

John James Alexander Evans, East Brighton, and George Holan, Brighton, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Division of Ser. No. 522,626, Nov. 11, 1974, Pat. No. 4,038,405. This application Mar. 10, 1977, Ser. No. 776,187
Claims priority, application Australia, Nov. 13, 1973, PB5638
Int. Cl.[2] A01N *9/22;* C07D *249/08, 401/04*
U.S. Cl. 424—263 6 Claims

1. 3(5)-(4-Pyridyl)-5(3)-trifluoromethyl-1,2,4-triazole.

2. 3(5)-(2,3,6-Trichlorophenyl)-5(3)-trifluoromethyl-1,2,4-triazole.

3. 3(5)-(4-Nitrophenyl)-5(3)-trifluoromethyl-1,2,4-triazole.

4. A pest control composition comprising an acaricidally effective amount of a triazole compound as defined in claim 1 in admixture with a solid or liquid carrier material.

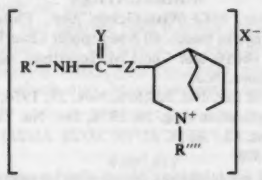
4,097,600

PHARMACEUTICAL COMPOSITION CONTAINING QUATERNARY AMMONIUM COMPOUNDS

Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 659,618, Feb. 20, 1976, Pat. No. 4,007,281, which is a division of Ser. No. 134,827, Apr. 16, 1971, Pat. No. 3,956,479, which is a division of Ser. No. 712,968, Mar. 14, 1968, Pat. No. 3,621,048, which is a continuation-in-part of Ser. No. 578,981, Sep. 13, 1966, abandoned. This application Nov. 12, 1976, Ser. No. 741,580
Int. Cl.[2] A61K *31/445*
U.S. Cl. 424—267 8 Claims

1. A pharmaceutical composition comprising an effective amount of a chemical compound effective against gram positive microorganisms represented by the formula:



where R′ is selected from the group consisting of an alkyl group containing 1 to 22 carbon atoms, a phenyl group, a phenyl group substituted by an alkyl group containing 1 to 5 carbon atoms, a phenyl group substituted by an alkoxy group containing 1 to 5 carbon atoms and a phenyl group substituted by halogen selected from the group consisting of chlorine and bromine;

R′′′′ is selected from the group consisting of an alkyl group containing 10 to 22 carbon atoms, a phenyl group substituted by halogen selected from the group consisting of chlorine and bromine, a phenyl group substituted by an alkyl group containing 1 to 5 carbon atoms, and a phenyl group substituted by an alkoxy group containing 1 to 5 carbon atoms;

Y is selected from the group consisting of oxygen and sulfur;

Z is selected from the group consisting of oxygen and sulfur; and

X is a compatible anion;

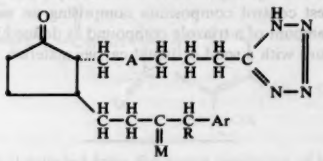
said compound being admixed with a pharmaceutically acceptable carrier.

4,097,601
BONE DEPOSITION BY 2-DESCARBOXY-2-(TETRAZOL-5-YL)-11-DEXOSY-16-ARYL PROSTAGLANDINS

Thomas Ken Schaaf, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 26, 1977, Ser. No. 827,935
Int. Cl.[2] A61K *31/41*
U.S. Cl. 424—269 **7 Claims**

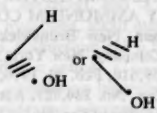
1. In the treatment of bone disorders, a method to increase the amount of both the osteomineral deposit and the osteoid present within bone by administration to a subject in need of said treatment an effective amount of a prostaglandin having the structure



or the pharmacologically acceptable salts thereof wherein:

A is ethylene or cis-vinylene:

M is oxo,



R is hydrogen or methyl;

and Ar is phenyl or monosubstituted phenyl, said monosubstituent being fluoro, chloro, bromo, trifluoromethyl, methyl, methoxy and phenyl.

4,097,602
METHOD OF INHIBITING BLOOD PLATELET AGGREGATION

Melvin J. Silver, 6640 Wissahickon Ave., Philadelphia, Pa. 19119; John Bryan Smith, 40 Needlepoint Lane, both of Philadelphia, Pa. 08016, and Carol M. Ingerman, 40 Needlepoint La., Willingboro, N.J.

Continuation of Ser. No. 528,594, Nov. 29, 1974, abandoned. This application Aug. 24, 1976, Ser. No. 717,277
Int. Cl.[2] A61K *31/19, 31/20, 31/215*
U.S. Cl. 424—305 **15 Claims**

1. A method for inhibiting blood platelet aggregation comprising administrating to an individual disposed toward undesirable blood platelet aggregation from about 5–400 mg/kg of body weight of 8,11,14-eicosatrienoic acid, the ester thereof or a pharmaceutical acceptable salt thereof.

4,097,603
GASTRIC CYTOPROTECTION WITH NON-ANTISECRETORY DOSES OF PROSTAGLANDINS

André Robert, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 6, 1977, Ser. No. 830,559
Int. Cl.[2] A61K *31/215, 31/19*
U.S. Cl. 424—305 **7 Claims**

1. A method of preventing non-NOSAC-induced gastric inflammatory disease in a human with high susceptibility to the acquisition of said disease, which comprises:

administering to said humans systemically a non-antisecretory dose of a gastric cytoprotective prostaglandin effective to prevent the development of said disease.

4,097,604
METHOD OF TREATING AND CONTROLLING GINGIVITIS

Geraldine H. Thiele, New Oxford, Pa., assignor to Oxford Hill, Ltd., New Oxford, Pa.

Continuation of Ser. No. 642,114, Dec. 18, 1975, and a continuation-in-part of Ser. No. 283,662, Aug. 25, 1972, Pat. No. 3,805,776, Ser. No. 283,663, Aug. 25, 1972, Ser. No. 123,830, Mar. 12, 1971, Pat. No. 3,767,812, and Ser. No. 113,362, Feb. 8, 1971, Pat. No. 3,741,204, said Ser. No. 642,114, is a continuation of Ser. No. 483,010, Jun. 25, 1974, Pat. No. 3,982,017, which is a continuation-in-part of Ser. No. 369,236, Jun. 12, 1973, Pat. No. 3,924,000, which is a continuation-in-part of Ser. No. 283,662, said Ser. No. 283,663, said Ser. No. 123,830, and said Ser. No. 113,362, said Ser. No. 283,662, said Ser. No. 283,663, and said Ser. No. 123,830, each is a continuation-in-part of said Ser. No. 113,362, said Ser. No. 283,662, and said Ser. No. 283,663, each is a continuation-in-part of said Ser. No. 123,830. This application Dec. 29, 1976, Ser. No. 755,400
Int. Cl.[2] A61K *31/20, 7/16*
U.S. Cl. 424—318 **10 Claims**

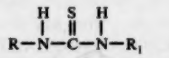
1. The method of treating and controlling gingivitis and related periodontal diseases of the gingival tissue which comprises contacting the diseased gingival tissue with a liquefied composition consisting essentially of (i) 0.5 to 10 percent by weight of a fatty acid salt prepared from an unsubstituted, unsaturated fatty acid having one double bond and from an alkali metal or an alkali metal compound or a basic alkali metal compound, said fatty acid having 14 to 22 carbon atoms; (ii) a liquid carrier; (iii) an effective amount of a buffering agent, and (iv) an effective amount of ethanol, the pH of said liquefied composition being between 9 and 11.

4,097,605
ALKYL THIOUREA MITICIDES

Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

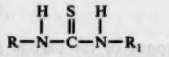
Continuation of Ser. No. 597,104, Jul. 18, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 742,157
Int. Cl.[2] A01N *9/12, 9/20*; C07C *157/09*
U.S. Cl. 424—322 **37 Claims**

1. A compound having the formula



wherein R is benzyhydryl, and R_1 is alkyl containing from 7 to 11 carbon atoms, inclusive.

5. A method of controlling mites consisting of applying to said mites a miticidally effective amount of a compound having the formula



wherein R is selected from the group consisting of benzhydryl, 3′-(2′-ethylhexoxy)-propyl, allyl, cyclohexyl, cycloheptyl, 1′,3′-dimethylbutyl, and alkyl containing from 7 to 13 carbon atoms, inclusive; and where R is benzhydryl, R_1 is alkyl containing from 7 to 11 carbon atoms, inclusive; where R is 3′-(2-ethylhexoxy)-propyl, R_1 is alkyl containing from 1 to 12 carbon atoms, inclusive; where R is allyl, R_1 is alkyl containing from 9 to 13 carbon atoms, inclusive; where R is cyclohexyl, R_1 is dodecyl; where R is cycloheptyl, R_1 is heptyl; where R is 1′-3′-dimethylbutyl, R_1 is n-heptyl or dodecyl; where R is heptyl, R_1 is alkyl containing from 6 to 8 carbon atoms, inclusive; where R is octyl, R_1 is alkyl containing from 6 to 10 carbon atoms, inclusive; where R is nonyl, R_1 is alkyl containing from 3 to 9 carbon atoms, inclusive; where R is decyl, R_1 is alkyl containing from 3 to 7 carbon atoms, inclusive; and

where R is undecyl, dodecyl, or tridecyl, R_1 is alkyl containing from 2 to 7 carbon atoms, inclusive.

4,097,606

APAP TABLET CONTAINING AN ALKALI METAL CARBOXYMETHYLATED STARCH AND PROCESSES FOR MANUFACTURING SAME

Leonard Chavkin, Mountainside, and F. Henry Merkle, Scotch Plains, both of N.J., assignors to Bristol-Myers Company, New York, N.Y.

Filed Oct. 8, 1975, Ser. No. 620,688
Int. Cl.[2] A61K *31/165, 47/00*
U.S. Cl. 424—324 25 Claims

1. As an article of manufacture, a tablet having a relatively high absorption rate for N-acetyl-p-aminophenol as measured by the blood plasma level of N-acetyl-p-aminophenol over time after ingestion comprising:

(a) from about 190 to 1000 milligrams of N-acetyl-p-aminophenol;

(b) from about 30 to 90 milligrams of a low substituted alkali metal carboxymethyl starch; and

(c) a non-toxic, pharmaceutically acceptable binder;

the ratio of N-acetyl-p-aminophenol to sodium alkali metal carboxymethyl starch, on a weight basis, being in the range of from about 5:1 to 10:1;

the quantity of binder present being in the range of from 0 to an amount no greater than the amount of N-acetyl-p-aminophenol contained in the tablet.

4,097,607

DETERRENT COMPOSITION, METHOD OF USING SAME, AND ARTICLE COATED THEREBY

Kenneth A. Larson, 225 Commerce Dr., Fort Collins, Colo. 80522

Filed Dec. 10, 1976, Ser. No. 749,303
Int. Cl.[2] A61K *31/11, 31/165*
U.S. Cl. 424—324 15 Claims

1. A deterrent for mammals comprising a carrier and an effective amount of cinnamic aldehyde wherein the carrier is an ointment which is substantially insoluble in water.

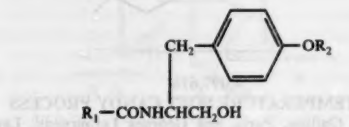
4,097,608

ANTI-ULCEROUS TYROSINE DERIVATIVES

Tosaku Miki; Yasuhiro Hosokawa; Tamotsu Miwa; Hiroshi Fujita; Masahide Asano, and Shunzo Aibara, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Division of Ser. No. 639,117, Dec. 9, 1975, Pat. No. 4,025,644.
This application Dec. 20, 1976, Ser. No. 752,511
Claims priority, application Japan, Dec. 18, 1974, 49-145133; Dec. 18, 1974, 49-145134; Apr. 2, 1975, 50-39959; Apr. 4, 1975, 50-41000
Int. Cl.[2] A61K *31/085, 31/165;* C07C *103/78*
U.S. Cl. 424—324 6 Claims

1. A compound of the formula:



wherein R_1 is phenyl or cycloalkyl and the phenyl may have at least one substituent selected from the group consisting of lower alkyl, lower alkoxy, halogen, amino and nitro; and R_2 is hydrogen or lower alkyl.

6. A method of treating ulcers in humans which comprises administering to said human a compound of claim 1 in an amount effective for treating said ulcers.

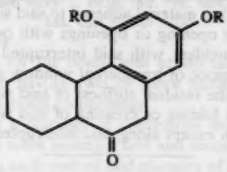
4,097,609

2,4-DISUBSTITUTED-4B,5,6,7,8,8A,9,10-OCTAHYDRO-9-OXO-PHENANTHRENES

Sandor Barcza, West Orange, N.J., and James B. Hendrickson, Cambridge, Mass., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 637,718, Dec. 4, 1975, Pat. No. 4,034,045, which is a continuation-in-part of Ser. No. 566,759, Apr. 10, 1975, abandoned, which is a continuation of Ser. No. 368,939, Jun. 11, 1973, abandoned. This application Mar. 2, 1977, Ser. No. 773,535
Int. Cl.[2] C07C *49/82;* A01N *9/24*
U.S. Cl. 424—331 5 Claims

1. A compound of the formula



where R represents hydrogen or lower alkyl having 1 to 4 carbon atoms.

4,097,610

PROCESS FOR MAKING FISHBAIT AND THE PRODUCT PRODUCED THEREBY

Ronald L. Morrison, 3719 NE. 74th Pl., Seattle, Wash. 98115, and John W. Dawson, Box 880, Long Beach, Wash. 98631

Filed Jan. 28, 1977, Ser. No. 763,543
Int. Cl.[2] A23L *1/325*
U.S. Cl. 426—1 9 Claims

1. A process for making fishbait from fish eggs, comprising the steps of:

(a) Mixing fish eggs, at least some of which are whole, with a slurry comprising a binder material, fish oil and fish egg residue to form a mixture;

(b) Spreading said mixture into a container;

(c) Brushing the exposed surface of the mixture in the container with oil; and

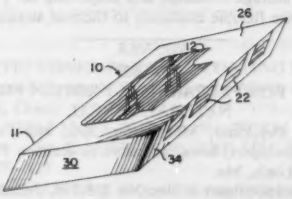
(d) Heating said mixture until it forms a soft, pliable, congealed mass, with the whole fish eggs being held in the now-solidified slurry, said congealed mass forming the fishbait, which may be conveniently cut into bait size portions.

4,097,611

SLICED FOOD PACKAGE WITH SIDE WINDOWS

Oscar E. Seiferth, and Calvin T. Royston, both of Madison, Wis., assignors to Oscar Mayer & Co. Inc., Madison, Wis.

Filed Mar. 15, 1973, Ser. No. 341,390
Int. Cl.[2] B65D *85/72;* B65B *25/06*
U.S. Cl. 426—121 3 Claims



1. A folding carton formed of paperboard and erectable from a flat sleeve or collapsed tube condition so as to have a top

panel which includes a window opening glazed with transparent film having relatively low resistance to wrinkling, a bottom panel and two sidewall panels with projecting unfolded end flaps on opposite ends of said panels by pivoting said panels along panel-interconnecting score lines, at least one sidewall panel having at least one window opening therein with each sidewall window opening extending all the way to one of its adjacent score lines which is interrupted by the presence of each window opening, said sidewall window opening or openings in aggregate being at least of such area that the material remaining in said side panel containing said window opening or openings will not provide sufficient residual stiffness to consistently initially fold or hinge only along said interrupted score line on erection from said flat or collapsed condition, and a relatively stiff substantially non-wrinkling piece of transparent window glazing material adhered to said sidewall containing said window opening or openings with one edge thereof substantially coincident with said interrupted score line, the stiffness of said piece of transparent window glazing material combined with the residual stiffness of said window sidewall panel to prevent folding or creasing of said window sidewall panel on erection except along said interrupted score line.

4,097,612

POTATO TREATMENT PROCESS

William Duncan Powrie, and Marvin Tung, both of Vancouver, Canada, assignors to Creston Valley Foods Ltd., Vancouver, Canada

Continuation-in-part of Ser. No. 531,166, Dec. 9, 1974, abandoned. This application Mar. 16, 1976, Ser. No. 667,460
Claims priority, application Canada, May 10, 1974, 199477
Int. Cl.[2] A23L *1/216*
U.S. Cl. 426—269 16 Claims

1. A process for treatment of raw white potatoes, which have previously been stored at temperatures of about 40° to 45° F, to improve their quality for subsequent thermal sterilization and storage in flexible containers without added liquid, which comprises immersing said stored potatoes, after they have been peeled, in whole or divided form, successively in:

(a) an aqueous solution containing

(1) 0.2 to 4% by weight of citric acid or sodium or potassium citrate, and

(2) 0.005 to 0.8% by weight of sulfur dioxide in free form or in the form of sodium or potassium sulfite, bisulfite or metabisulfite; said aqueous solution having a pH of 2.3 to 6.5, the immersion of the potatoes in said solution (a) being from about 1 minute at 190° F to 5 minutes at 110° F;

(b) an aqueous solution containing sodium or potassium pyrophosphate in a concentration of 0.5 to 1.5% by weight, the immersion of the potatoes in said solution (b) being from 15 seconds at 212° F to 60 seconds at 140° F; and

(c) an aqueous solution of a non-toxic alkaline earth metal salt in a concentration of 0.05 to 0.5% by weight, the immersion of the potatoes in said solution (c) being from 15 seconds at 212° F to 60 seconds at 140° F. and thereafter sealing the peeled potatoes, without added liquid, in a flexible storage container and subjecting the peeled potatoes in the flexible container to thermal sterilization.

4,097,613

PROCESS FOR PREPARING A PROTEIN FORTIFIED NATURAL CEREAL

William R. DeLauder, Manchester, Mo., and Ferdinand E. Spring, Davenport, Iowa, assignors to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 599,794, Jul. 28, 1975, abandoned. This application Dec. 22, 1976, Ser. No. 753,118
Int. Cl.[2] A23L *1/10*
U.S. Cl. 426—303 6 Claims

1. A process for the production of a particulate protein fortified, natural cereal product having a protein content of at least about 20% by weight comprising;

(a) forming a mixture of different, whole farinaceous grains, and a fortifying amount of a textured vegetable protein material having a protein content of above 30% by weight, said amount being sufficient to provide greater than a 20% protein content in the final product;

(b) coating said mixture with an oil prior to or following a coating with sweetening solution and

(c) drying said mixture at a temperature and period of time sufficient to provide a moisture content below about 5% by weight thereby providing a protein fortified natural cereal product.

4,097,614

METHOD OF REMOVING BITTER SUBSTANCES FROM BREWERS YEAST AND BREWERS YEAST AUTOLYSATES

Simon Michael West, Williamstown, Australia, assignor to Kraft Foods Limited, Port Melbourne, Australia

Filed Dec. 23, 1976, Ser. No. 753,688
Claims priority, application Australia, Dec. 24, 1975, 4395/75
Int. Cl.[2] C12C *11/28*
U.S. Cl. 426—422 8 Claims

1. A method for removing isohumulones from suspensions of brewers yeast and from brewers yeast autolysates, wherein the suspensions or autolysates are brought into contact with a composite adsorbent material which comprises adsorbent carbon particles and magnetic particles embedded in a porous matrix of organic polymeric material, the pore size of such matrix being within the range 2–30nm and such as to allow molecules of the isohumulones to enter freely into the interstitial structure of the matrix, but to exclude larger molecules which are to be retained in the suspension or solution being treated, and wherein the loaded composite adsorbent material is subsequently separated from the suspension or solution being treated.

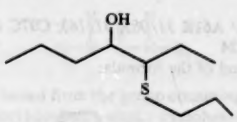
4,097,615

FLAVORING WITH 3-PROPYLTHIO-4-HEPTANOL

William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 730,537, Oct. 7, 1976, Pat. No. 4,044,164. This application Feb. 4, 1977, Ser. No. 765,833
Int. Cl.[2] A23L *1/226*
U.S. Cl. 426—535 2 Claims

1. A process for augmenting or enhancing the taste or aroma of a foodstuff comprising the step of adding to said foodstuff from about 0.1 ppm up to about 50 ppm by weight of said foodstuff of 3-propylthio-4-heptanol having the structure:



4,097,616

LOW TEMPERATURE SOFT CANDY PROCESS

Jean Pierre Guillou, Paris, and Georges Letourneau, Lagny, both of France, assignors to General Foods France, S.A., Montreuil-sous-Bois, France

Filed Jan. 12, 1977, Ser. No. 758,537
Claims priority, application France, Jan. 23, 1976, 76 01906
Int. Cl.[2] A23G *3/00*
U.S. Cl. 426—548 4 Claims

1. A process for making a soft candy containing a sweetener substantially completely in the crystalline state and which does

not lose its crystallinity throughout the process which consists of the steps of

(a) admixing, at a temperature of from about 45° C. to about 60° C., to form a soft paste,

(1) from about 85% to about 90% by weight of the final product of a crystalline sweetener selected from the group consisting of an edible polyhydric alcohol, sucrose, glucose and mixtures thereof, all of said sweetener having a particle size of 100 microns or less, with

(2) a binder consisting of from about 4% to about 8% of an aqueous gelatin sol containing approximately 33% of gelatin by weight of the sol, and

(3) minor, but effective, amounts of food coloring, flavoring and edible aciduant,

(b) extruding the soft paste to form rods and/or sheets,

(c) cooling the extruded rods and/or sheets of soft paste to room temperature, and

(d) forming and shaping the cooled, extruded paste into candy units.

4,097,617

PHOSPHONITRILE FLUOROELASTOMER COATED CARRIER PARTICLES FOR USE IN ELECTROPHOTOGRAPHIC PROCESS

Pabitra Datta, Cranbury, N.J., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Sep. 7, 1977, Ser. No. 831,147
Int. Cl.[2] G03G 9/10, 9/14
U.S. Cl. 427—14 **8 Claims**

7. A process for developing a latent electrostatic image which comprises

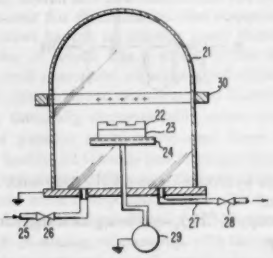
mixing an electroscopic powder with a carrier comprising a member selected from the group consisting of metallic particles and siliceous particles to the surface of which is adhered a phosphonitrile fluoroelastomer to impart opposite electrostatic charges to said electroscopic powder and said carrier, whereby said electroscopic powder is attracted to said carrier and transferring said electroscopic powder from said carrier to said latent electrostatic image.

4,097,618

METHOD OF TRANSFERRING A SURFACE RELIEF PATTERN FROM A POLY(1-METHYL-1-CYCLOPROPENE SULFONE) LAYER TO A NON-METALLIC INORGANIC LAYER

Eugene Samuel Poliniak, Willingboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,862
Int. Cl.[2] B05D 3/06
U.S. Cl. 427—41 **7 Claims**



1. A method for forming a surface relief pattern in a non-metallic inorganic layer which comprises:

a. dissolving poly(1-methyl-1-cyclopropene sulfone) in a solvent;

b. applying the resultant solution to the non-metallic inorganic layer to form a wet poly(1-methyl-1-cyclopropene sulfone) layer on the non-metallic inorganic layer;

c. exposing the wet layer to a modulated beam of electrons;

d. developing the exposed wet layer to form a surface relief pattern;

e. bombarding the developed surface with sufficient ions to substantially remove the wet layer and form the surface relief pattern in the non-metallic inorganic layer.

4,097,619

MANIFOLD CARBONLESS FORM AND PROCESS FOR THE CONTINUOUS PRODUCTION THEREOF

Gerald Titus Davis, and Dale Richard Shackle, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed May 7, 1976, Ser. No. 684,460
Int. Cl.[2] B05D 3/06
U.S. Cl. 427—44 **17 Claims**

1. A process for the continuous production of a manifold carbonless form having two or more surfaces coated with chromogenic material comprising:

(a) providing a plurality of continuous webs; each of said continuous webs having a first and second surface;

(b) advancing each web of said plurality of continuous webs at substantially the same speed, said plurality of continuous webs being spaced apart and being advanced in a cooperating relationship with one another;

(c) marking at least one surface of at least one web of said plurality of continuous webs with a pattern;

(d) applying a first non-aqueous, solvent-free coating of a first chromogenic material to at least a portion of said first surface of at least one web of said plurality of continuous webs, said first non-aqueous, solvent-free coating comprising said first chromogenic material dispersed in a hot melt suspending medium, said coating being heated to a temperature above the melting point of said hot melt suspending medium to permit fluid application of said first coating composition to said first surface;

(e) setting said first coating by means of temperature decrease;

(f) applying a second coating of a second chromogenic material to at least a portion of said second surface of at least one web of said plurality of continuous webs, said second coating comprising said second chromogenic material dispersed in a hot melt suspending media, said second coating being heated to a temperature above the melting point of said hot melt suspending media to permit fluid application of said second coating composition to said second surface, said second chromogenic material being reactive with said first chromogenic material to form a color;

(g) setting said second coating by means of temperature decrease;

(h) collating said plurality of continuous webs such that said first and said second chromogenic materials are in facing relationship to a coreactive chromogenic material; and

(i) placing said collated continuous webs in contiguous relationship to one another to create a manifold form.

4,097,620

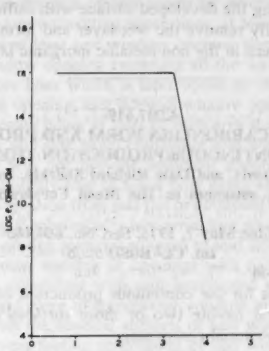
MAGNETIC TONER PARTICLE COATING PROCESS

Chin H. Lu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 2, 1977, Ser. No. 792,634
Int. Cl.[2] G03G 9/08; H01F 1/11
U.S. Cl. 427—127 **18 Claims**

1. A process of coating magnetic toner particles comprising neutralizing a fatty acid material selected from the group comprising fatty acids, fatty acid derivatives and mixtures thereof with ammonium hydroxide to form a water soluble ammonium compound in aqueous solution, adding particles to the solution,

heating the solution at below the boiling pont, filtering the solution, washing and drying to recover the coated particles



wherein said fatty acid material is present in an amount between about 0.1 and 10 weight percent of the particle.

4,097,621

METHOD FOR MANUFACTURING BIAS FABRIC

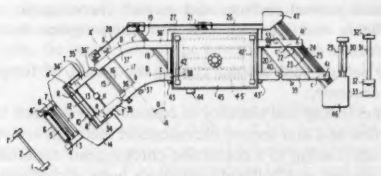
Kaname Shirasaka, Takatsuki; Yoshihiro Nakagami, Akashi; Takashi Tomiyori, Kobe; Masanori Ikemoto, Kobe, and Tsuneo Shaura, Kobe, all of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Division of Ser. No. 580,280, May 23, 1975, Pat. No. 4,034,702, which is a continuation-in-part of Ser. No. 404,566, Oct. 9, 1973, abandoned. This application Oct. 7, 1976, Ser. No. 730,393

Claims priority, application Japan, Oct. 9, 1972, 47-101417

Int. Cl.² D06C *3/02*

U.S. Cl. 427—173 **3 Claims**



1. A method for manufacturing a bias fabric comprising supplying a continuous running length of fabric having an initial width and orthogonally disposed warp and weft, gripping the opposed edges of said running length, feeding said fabric along a first straight path, changing the direction of said running length by moving opposite edges of said fabric simultaneously along identical spaced apart curved paths of equal arc length having radii greater than said initial width and disposed in the plane of said fabric to change the direction of the warp while maintaining the weft in the same direction and while preventing wrinkling or bunching of the fabric, maintaining said fabric at its predetermined width prior to changing the direction, feeding said fabric in a new direction along a second straight path subsequent to changing the direction, releasing the opposed edges of said running length of fabric diagonally of the second straight path and taking up said fabric.

4,097,622

Patent Not Issued For This Number

4,097,623

SHAPED ARTICLE OF CELLULOSE HYDRATE WITH A COATING OF PLASTIC MATERIAL OF CHEMICALLY MODIFIED PROTEIN AND PROCESS FOR THE PRODUCTION THEREOF

Klaus-Dieter Hammer, Mainz; Wolfgang Klendauer, and Martin Schröder, both of Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

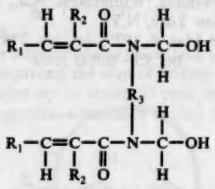
Filed Oct. 3, 1975, Ser. No. 619,225

Claims priority, application Germany, Oct. 7, 1974, 2447757

Int. Cl.² B05D *7/02, 7/22;* A22C *13/00*

U.S. Cl. 427—230 **24 Claims**

1. A process for coating the surface of a shaped article of cellulose hydrate with a layer of polymer material which comprises applying to the surface of a shaped article in the gel state and based on cellulose hydrate, a liquid layer of an aqueous solution of a chemically modified protein obtained by mixing an aqueous alkaline protein solution with an aqueous solution of N-methylol-acrylamide or N-methylolmethacrylamide or of the alkoxy derivatives thereof of aliphatic alcohols with 1 to 8 carbon atoms, particularly of organic, tetrafunctional, doubly unsaturated compounds of the general formula



in which

R_1 and R_2 are hydrogen or an alkyl group with 1 to 6 carbon atoms, and

R_3 is the group $-(CH_2)_n-$, n being an integer from 1 to 8, or the group

in which R_4 is an alkyl group with 1 to 18 carbon atoms, subjecting the liquid mixture to a dwell time, heating the coated shaped article at a temperature in the range between 80° and 120° C, which heat is sufficient to remove the water from the shaped article and to effect the chemical reaction between

the reactive OH groups of the chemically modified protein and the OH groups of the cellulose hydrate forming the shaped article, and wetting the shaped article with water until it has a portion in the range between 8 to 12% by weight of water calculated on the total weight of the shaped article.

4,097,624

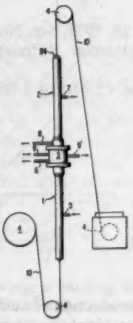
METHOD FOR THE METALLIZATION OF FIBERS

Hermann J. Schladitz, Munich, Germany, assignor to University of Virginia, Charlottesville, Va.

Division of Ser. No. 763,013, Jan. 27, 1977. This application Sep. 30, 1977, Ser. No. 838,063

Int. Cl.[2] B05D *3/04, 7/20*

U.S. Cl. 427—251 8 Claims



1. A method for decontaminating and subsequently metallizing a filament which comprises passing the filament through the inner tube of a first chamber for decontamination which comprises two concentric tubes having an annular space therebetween, the inner tube of which has a series of fine holes therein; wherein said inner tube is heated and said annular space contains an inert gas such that said gas flows through said holes in heated jet streams which impinge upon said filament, thereby heating and decontaminating said filament;

passing said heated and decontaminated filament into a second chamber for metallization also comprising two concentric tubes having an annular space therebetween, the inner tube of which has a series of fine holes therein; wherein said inner tube of said second chamber is heated and said annular space of said second chamber contains a gaseous, thermally decomposable metal compound such that said gaseous metal compound flows through said holes in heated jet streams and impinges upon said heated and decontaminated filament, thereby thermally decomposing said metal compound and metallizing said filament;

disposing an intermediate chamber in alignment with and with ends in sealing relationship with the respective ends of said decontamination and metallization chambers and having a membrane disposed intermediately and transversely thereof;

communicating each said inner tube with its associated section of the intermediate chamber

drawing off gaseous material entering each said section from said inner tubes; and

passing said heated and decontaminated filament through said intermediate chamber and through a pinhole aperture in said membrane prior to said passing through the metallization chamber.

4,097,625

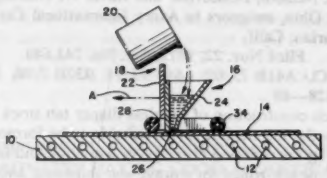
LOW MELTING TEMPERATURE METAL COATING PROCESS, APPARATUS AND PRODUCT

Norman Laurence Lunn, Beaver; Charles Jeffrey McCrea, New Galilee, both of Pa.; Raymond David Pregaman, Norcross, Ga., and Lawrence Edward Turowski, New Kensington, Pa., assignors to St. Joe Minerals Corporation, New York, N.Y.

Continuation of Ser. No. 511,203, Oct. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 433,523, Jan. 15, 1974, abandoned. This application Jun. 17, 1977, Ser. No. 807,661

Int. Cl.[2] C23C *7/00;* B44D *1/44;* B32B *35/00;* B37B *31/00*

U.S. Cl. 427—360 6 Claims



1. A method of mechanically bonding to a non-metallic porous substrate a metal selected from the group consisting of lead or lead-base alloys, zinc or zinc-base alloys, tin or tin-base alloys, cadmium or cadmium-base alloys, and aluminum or aluminum-base alloys, comprising heating said selected metal to its molten state; supporting a non-metallic porous substrate on a heat sink; while supported dispensing in a continuous rectilinear pattern a stream of the molten metal on the supported non-metallic porous substrate to be coated; continuously pressing the dispensed metal while still molten into the substrate and causing said dispensed metal to solidify immediately following the pressing step.

4,097,626

CONSTRUCTION FOR A FIBER REINFORCED SHAFT

Richard Lee Tennent, La Mesa, Calif., assignor to Grafalloy Corporation, El Cajon, Calif.

Filed Jun. 7, 1976, Ser. No. 693,147

Int. Cl.[2] D02G *3/00;* A63B *53/10;* B32B *5/12*

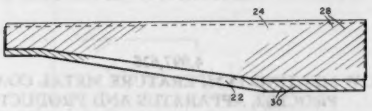
U.S. Cl. 428—36 6 Claims

1. A construction for a fiber reinforced generally cylindrical shaft comprising:

a first circumferential section of the thickness of said shaft comprising a plurality of radial plies forming in transverse aspect alternate interleaved wound helicies,

each of said helicies having more than one turn around said shaft,

each of said plies comprising a plurality of parallel reinforcing fibers in matrix material oriented in longitudinal aspect at a ptich angle of inclination to the longitudinal axis of said shaft at substantially 35°,



the fibers in alternate radial plies having pitch angles of opposite inclination, wherein the inner terminus of alternate of said radial plies are substantially diametrically opposite.

4,097,627

DOUBLE FACED TAB FASTENER CHARACTERIZED BY A STRIP OF RELEASE AGENT DESIGNED TO EXTEND PARTLY BEYOND THE WIDTH OF A STRIP OF ADHESIVE

Suzette B. Nemeth, Painesville, and David W. Wilson, Mentor, both of Ohio, assignors to Avery International Corporation, San Marino, Calif.

Filed Nov. 22, 1976, Ser. No. 743,640
Int. Cl.² A41B *13/02*; A61F *13/16*; B32B *7/06, 7/14*
U.S. Cl. 428—40 **3 Claims**

1. A web construction of linerless diaper tab stock made up of initially flat but flexible layers suitable to be formed in long passes along the machine direction of a coating and laminating line and to be self-rolled for storage and shipment, and unrolled for use by diaper manufacturers, and fabricatable completely by web coating and slitting operations and without the necessity for folding or web-to-web fastening operations, and suitable for high speed dispensing on automatic equipment, including a substrate extending, transversely to machine direction, along first and second endward length portions and an intermediate third length portion between the other two, the substrate bearing first adhesive on its top side along the first length portion, the substrate bearing second adhesive on its bottom side along the second length portion, the substrate being free of adhesive on each side along the intermediate third length portion, said first length portion bearing release means on its bottom side for releasably supporting adhesive, corresponding to said first adhesive, that is associated with an adjacent wrap when the web construction is self-wound, said last-named release means extending partially across said intermediate third length portion toward the adhesive on said second length portion but stopping short thereof to define a gap on the bottom of said third length portion which gap bears no release means, said second length portion bearing release means on its top side for releasably supporting said first adhesive when tabs have been formed from said stock and said first length portion is folded back over said second length portion.

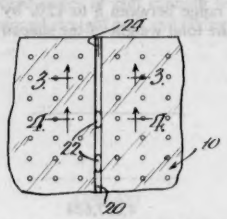
4,097,628

CARPET RUNNER

Albert B. Cheris, Glenview, and Lonnie E. Frye, Elk Grove Village, both of Ill., assignors to Tenex Corporation, Elk Grove Village, Ill.

Filed Dec. 8, 1975, Ser. No. 638,703
Int. Cl.² B65D *65/28*
U.S. Cl. 428—43 **2 Claims**

1. In a carpet runner including an elongated web of flexible, liquid-impervious, plastic material having on one side thereof a plurality of projections for gripping the nap of an underlying carpet, the improvement wherein said web is provided with a plurality of substantially equally spaced, transverse lines of weakening whereby a desired predetermined length of said web may be easily separated from the remainder thereof along a desired one of said lines to provide a carpet runner of a desired length without the use of cutting tools or the like, said lines of weakening being liquid-impervious, said lines of weakening being defined by grooves extending only partially



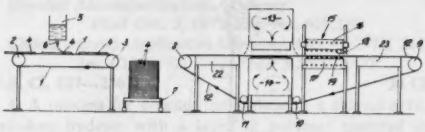
through said web, said grooves including spaced strengthening ribs.

4,097,629

PROCESS AND APPARATUS FOR THE PRODUCTION OF LAMINATED SHEETS

Walter Schneider, 54 Wildenbühlstrasse, Langnau am Albis, Switzerland

Filed Feb. 14, 1977, Ser. No. 768,028
Claims priority, application Switzerland, Feb. 24, 1976, 2223/76
Int. Cl.² B32B *3/00*
U.S. Cl. 428—71 **9 Claims**



1. A process for the production of sandwiched sheets with at least one sheet core of stable shape which is provided on both sides with firmly adhering covering sheets and which consists of a thermally insulating and sound-attenuating material, particularly for the production of doors, cupboards, chests and similar containers as well as of partition walls in buildings, in which both sides of said sheet core are formed of foam plastic and a fusion adhesive is applied to both sides of said sheet core the melting point of said adhesive being below the conversion point of said foam plastic, after which the said sheet core is provided with said covering sheets, and together with these latter, is heated for a short time to the melting point of the fusion adhesive, moulded in the heated state and cooled during the moulding.

4,097,630

FLAME RETARDANT CARPET

Judd Leonard Schwartz, Chester, and Richard Eugene Mayer, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Sep. 7, 1976, Ser. No. 721,003
The portion of the term of this patent subsequent to Oct. 12, 1993, has been disclaimed.
Int. Cl.² B32B *3/02, 33/00*
U.S. Cl. 428—97 **8 Claims**

1. A flame-retardant pile carpet having a relatively pliable primary backing and a tufted surface, said surface being comprised of fibers selected from the group consisting of polyester and polyamide fibers having incorporated therein from 0.1 to 15 percent by weight of zinc oxide, said fibers being bonded to said backing with a bonding substance comprising a latex material selected from the group consisting of vinylidene chloride polymers and vinyl chlorine-vinylidene chloride copolymers, and a hydrate material selected from the group consisting of aluminum hydroxide and hydrated aluminum oxide, the

ratio by weight of said latex material to said hydrate material being within the range 1:2 to 1:4.5.

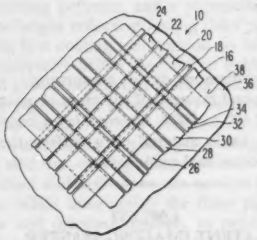
8. In a process for producing a pile carpet having a relatively pliable primary backing through which polyamide fibers are tufted, the improvement which comprises incorporating in said fibers from 1 to 12 percent by weight of zinc oxide, and bonding said fibers to said backing with a bonding substance comprising a latex material selected from the group consisting of vinylidene chloride polymers and vinyl chloride-vinylidene chloride copolymers, and a hydrate material consisting of hydrated aluminum oxide, the ratio by weight of said latex material to said hydrate material being within the range 1:2 to 1:4.5, whereby the carpet has improved flame-retardancy.

4,097,631

SURFACE COVERING WITH INTERWOVEN FABRIC STRIPS

Judy Wilken, 15143 Kennedy Rd., Los Gatos, Calif. 95030

Filed May 23, 1977, Ser. No. 799,890
Int. Cl.[2] B32B *3/00, 7/14*
U.S. Cl. 428—114 **8 Claims**



1. In a surface covering: a backing sheet forming a base; a plurality of first, flat fabric strips extending along one face of the backing sheet and being in substantially parallel, side-by-side relationship to each other; a number of second flat, side-by-side fabric strips substantially perpendicular to the first strips and interwoven therewith, each of the first and second strips having spaced, first segments contiguous to the base and spaced, second segments in overlying relationship to the first segments of adjacent strips; and means on said one face of said base for bonding said first segments thereto, the widths of certain of the strips being different from the widths of other strips, and the strips being sufficiently flexible to permit the second segments of at least some of the strips to bow outwardly of the adjacent first segments to provide a quilted appearance for the covering when the same covers a surface.

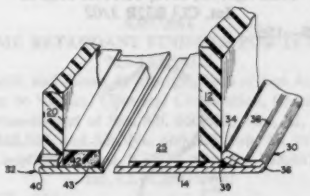
4,097,632

PRODUCT FOR CONSTRUCTING THREE-DIMENSIONAL SIGN CHARACTER

Robert W. Minogue, Cupertino, and Lloyd E. Troyer, San Carlos, both of Calif., assignors to Let-R-Edge of Canada, Ltd., Edmonton, Canada

Division of Ser. No. 379,012, Jul. 13, 1973, Pat. No. 3,937,384, which is a continuation-in-part of Ser. No. 356,983, May 3, 1973, abandoned. This application Sep. 12, 1975, Ser. No. 612,896
Int. Cl.[2] G09F *7/12*
U.S. Cl. 428—130 **5 Claims**

1. An opaque sheet strip for circumscribing the periphery of a sign character having a plastic face, said sheet strip comprising: an elongate sheet metal strip having first and second side edges, at least one of said edges of said metal strip having a convolute fold wherein a first longitudinal area immediately adjacent said convoluted edge is folded back to contact a second longitudinal area immediately adjacent said first longitudinal area; an abraded band on said sheet metal strip adjacent said convolute fold; a plastic strip overlying said abraded band, said plastic strip having a width substantially greater than the thickness of said plastic face, said plastic strip extending a distance in the plane of said metal strip substantially greater than the thickness of said plastic face, and said plastic strip being suitable for bonding to said plastic face; and a layer of adhesive between said plastic strip and said abraded band for



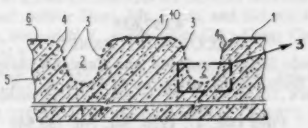
bonding said plastic strip to said abraded band adjacent said convoluted edge, the edge of said plastic strip adjacent said convoluted edge of said metal strip registered with respect to said metal strip to abut said convolute fold but not be mechanically gripped by said convolute fold.

4,097,633

PERFORATED, EMBOSSED FILM TO FOAM LAMINATES HAVING GOOD ACOUSTICAL PROPERTIES AND THE PROCESS FOR FORMING SAID

Bruce E. Focht, Trainer, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 583,799, Jun. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 476,216, Jun. 4, 1974, abandoned. This application Nov. 22, 1976, Ser. No. 743,664
Int. Cl.[2] B32B *3/24, 5/32;* **E04B** *1/86;* **E04F** *13/00;* **G10K** *11/04*
U.S. Cl. 428—138 **9 Claims**



1. An acoustical film-to-foam laminate comprising an open cell foam and a deformable film, said foam having a surface embossed with a non-random, predetermined pattern having crowns, sidewalls and valleys, the deformable film being adhesively attached to the foam, conforming to the pattern on the embossed surface and having perforations through the film predominately in sidewalls and valleys of the pattern, said valleys having a depth of at least 1/160 of an inch and said film having a hydrophobic lubricant and release agent coated thereon.

6. A water resistant, aesthetically self healing and acoustical film-to-foam laminate comprising:

an open cell foam and a deformable film, said foam having a surface embossed with a non-random, predetermined pattern having crowns, sidewalls and valleys, the deformable film being adhesively attached to the foam, conforming to the pattern on the embossed surface and having perforations through the film predominately in the sidewalls and valleys of the pattern, said perforations being sufficient in number to provide a porosity of the laminate of from about 3 cubic feet per minute per square foot to about 100 cubic feet per minute per square foot, and said film having a coating of a hydrophobic lubricating and release agent.

4,097,634
THERMOPLASTIC RESIN MOLDING OF COMPLEX DECORATIVE RELIEF

Eugene H. Bergh, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 19, 1976, Ser. No. 678,363
Int. Cl.[2] B32B 3/02
U.S. Cl. 428—156 9 Claims

1. Process for forming essentially continuous thermoplastic resin molding on a continuously rotating forming wheel having a complex intaglio in its circumferential surface and doctor means providing an orifice tangential to the forming wheel and a pair of interstices at the sides of the orifice comprising the steps of

(1) heating the thermoplastic resin to a molten state,

(2) providing a bank of the molten resin in contact with the forming wheel at the leading edge of the orifice sufficient to fill the intaglio as the forming wheel rotates and to flow through said interstices to provide a pair of resin flashes,

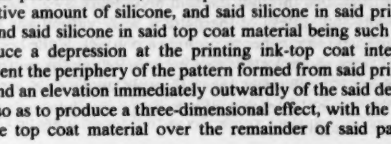
(3) cooling the resin deposited in the intaglio while the forming wheel continues to rotate until the resin develops tenacity at least at its surface contacting the intaglio, and

(4) continuously removing from the intaglio a cooled resin molding which has complex decorative relief and yet is essentially free from external defects and internal strains.

4,097,635
DECORATIVE PANEL

José Antonio Sanz Hernández, and Cassiano Mesquita Netto, both of Salto, Brazil, assignors to Eucatex, S.A., Sao Paulo, Brazil

Filed Dec. 27, 1976, Ser. No. 755,545
Int. Cl.[2] B32B 3/02, 3/10, 9/04
U.S. Cl. 428—172 4 Claims

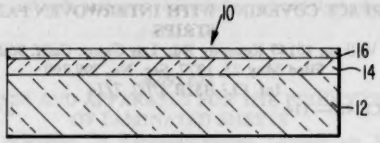


1. In a decorative panel comprising a pigmented base coated substrate, a silicone containing printing ink forming a pattern on a portion of said substrate and a top coat material covering said pattern and the remaining portion of said substrate, the improvement comprising said printing ink containing at least 5 weight percent silicone, said top coat material containing an effective amount of silicone, and said silicone in said printing ink and said silicone in said top coat material being such as to produce a depression at the printing ink-top coat interface adjacent the periphery of the pattern formed from said printing ink and an elevation immediately outwardly of the said depression so as to produce a three-dimensional effect, with the level of the top coat material over the remainder of said pattern being substantially the same level as the remainder of said panel wherein the remainder of said pattern and the remainder of said panel are smooth and essentially free of separate islands of said top coat material.

4,097,636
METALLIZED DEVICE

Frank Zygmunt Hawrylo, Trenton, and Henry Kressel, Elizabeth, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 490,792, Jul. 22, 1974, Pat. No. 3,945,902.
This application Jun. 18, 1975, Ser. No. 588,025
Int. Cl.[2] B32B 15/04
U.S. Cl. 428—209 2 Claims



1. A metallized diamond device comprising:

a body of diamond material of silicon or aluminum having a thickness of 400 to 500A having a layer consisting essentially of an oxide material on a surface thereof, and a metallic layer on said oxide layer.

4,097,637
LATENT IMAGING MASTER

Adrian M. Loria, Evanston, and Richard E. Thomas, Chicago, both of Ill., assignors to A. B. Dick Company, Niles, Ill.

Filed Mar. 29, 1976, Ser. No. 671,137
Int. Cl.[2] B32B 5/16, 7/02; B41M 5/04
U.S. Cl. 428—212 12 Claims

1. A master for producing multiple latent imaged copies comprising a base sheet and multiple coatings on the surface of the base sheet including a base coat containing a water and/or alcohol soluble colorless color-forming component and at least two electrically conductive coatings overlying the base coat containing electrically conductive particles arranged to provide an electrical gradient of increasing conductivity in the direction towards the base coat.

4,097,638
SELECTIVELY SORPTIVE REINFORCED SHEET

Otis R. Videen, St. Paul, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed Dec. 20, 1976, Ser. No. 752,528
Int. Cl.[2] B01D 39/18
U.S. Cl. 428—213 6 Claims

1. A wipe sheet for selectively sorbing at least one hydrocarbon liquid from an aqueous-hydrocarbon mixture, said wipe sheet comprising:

(a) at least two cotton fiber layers, each said cotton fiber layer being non-woven and being predominately composed of cotton fibers together with a minor amount of polymeric fibers preferentially sorptive of hydrocarbon liquids over water, said cotton fibers having an average length of at least about one-half inch and having been sized with at least one oleophillic, hydrophobic agent, and each said cotton fiber layer being from about 1/64 inch to about ¼ inch in thickness and having a density of from about 2 to 10 pounds per cubic foot;

(b) a flexible net reinforcing layer, said reinforcing layer being composed of a polyolefin and having been biaxially oriented after extrusion to at least 5 times its extruded

dimension and said reinforcing layer having a weight of from about ½ to about 3 pounds per thousand square feet;
(c) said cotton fiber layers being affixed together with said reinforcing layer sandwiched therebetween.

4,097,639
FLAMBOYANT FINISH AND PROCESS FOR APPLYING SAME

John M. Millar, Joppa, Md., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Nov. 24, 1976, Ser. No. 744,763
Int. Cl.² B05D *1/38, 5/06, 7/14;* B32B *15/08*
U.S. Cl. 428—215 **33 Claims**

1. A method of applying a coating having good depth appearance to an electrically conductive substrate, said method comprising

applying to said substrate a coating at least ½ mil thick of a first coating composition consisting essentially of at least one substantially clear thermosetting film-forming polymer, a catalytic amount of at least one blocked catalyst for said polymer, wherein said catalyst unblocks at a temperature at least 5° F above the melting temperature of said thermosetting polymer, and a pigmenting amount of at least one bright reflective leafing flake pigment,

heating the first coating composition on said substrate to a first temperature below the catalyst unblocking temperature and above the polymer melting temperature to permit the flake pigments to substantially become oriented parallel to the surface of said composition away from said substrate, and thereafter gelling or curing said polymer by heating said first coating composition to a higher second temperature which is above the catalyst unblocking temperature while maintaining the flake pigments substantially in said oriented position, to produce a gelled or cured first coating having a bright reflective appearance,

and thereafter coating the first coating with a second coating at least one half mil thick of a transparent second coating composition consisting essentially of at least one at least substantially clear film-forming second polymer and a tinctorial amount which is at least about 0.1% by weight, based on the weight of said second coating composition, of at least one coloring agent which is substantially soluble in said second polymer and heat stable at the curing or fusing temperatures of said second polymer,

and thereafter curing or fusing said second polymer to form an integral film thereof.

4,097,640
PRODUCTION OF FIBROUS SHEET MATERIAL

Harold George Curry, Hambrook, near Bristol; Brian William Attwood, Hanham, near Bristol; Derek Graham Walter White, Bristol, all of England; John Mosgaard Christensen, Risskov, and Karl Kristian Kobs Kroyer, Viby J, both of Denmark, assignors to Karl Kroyer St. Anne's Limited, Bristol, England

Continuation of Ser. No. 534,240, Dec. 19, 1974, abandoned, which is a division of Ser. No. 375,094, Jun. 29, 1973, abandoned. This application Dec. 16, 1976, Ser. No. 751,038
Claims priority, application United Kingdom, Jul. 8, 1972, 32098/72
Int. Cl.² B32B *29/00;* B65D *5/00*
U.S. Cl. 428—219 **7 Claims**

1. Foldable boxboard made by a dry-laying process, consisting essentially of cellulosic fibers and from 1 to 10% by weight of starch and having the following characteristics:

(a) a weight of at least 210 g.s.m.;
(b) a stiffness in the machine direction of at least 5.8 Kenley units; and
(c) a ratio of stiffness in the machine direction and in the cross-machine direction of substantially 1:1.

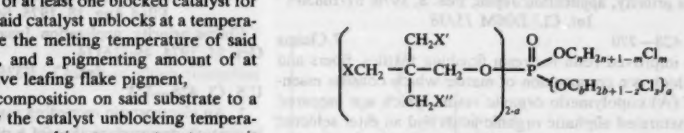
4,097,641
FLAME RETARDANT FINISHES FOR TEXTILE MATERIALS

Ray E. Smith, and James A. Albright, both of Ann Arbor, Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 660,520, Mar. 22, 1976, Pat. No. 4,015,037, and Ser. No. 660,500, Feb. 23, 1976. This application Dec. 9, 1976, Ser. No. 748,957
Int. Cl.² C09D *1/00*
U.S. Cl. 428—245 **45 Claims**

1. A flame retardant textile finish consisting essentially of:

(i) from about 2 to about 60 percent (by weight) of a flame retardant compound of the formula



wherein X,X′ and X″ are hydrogen, chlorine and bromine; *a* is 0 or 1; *n* is an integer of from 1 to 7; *m* is an integer of from 1 to *n; b* is an integer of from 1 to 7; and *z* is an integer of from 1 to *b;*

(ii) from about 2 to about 18 percent (by weight) of an emulsifying agent;

(iii) from about 2.6 to about 97.4 percent (by weight) of water; and

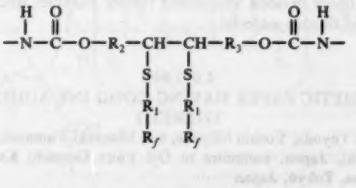
(iv) from about 0.4 to about 48 percent of an organic solvent.

4,097,642
FABRIC COATED WITH RF-GLYCOLS CONTAINING TWO PERFLUOROALKYLTHIO GROUPS

Robert Ernest Arthur Dear, Mt. Kisco, and Robert Allan Falk, New City, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 631,004, Nov. 12, 1975, Pat. No. 4,054,592, which is a continuation-in-part of Ser. No. 439,497, Feb. 4, 1974, Pat. No. 3,935,277. This application May 19, 1977, Ser. No. 798,285
Int. Cl.² C07C *125/06*
U.S. Cl. 428—262 **5 Claims**

1. A textile substrate bearing from 0.01 to 10% by weight of a urethane composition which contains at least one unit of formula



where

R_f is perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms,

R_1 is branched or straight chain alkylene of 1 to 12 carbon atoms, alkylenethioalkylene of 2 to 12 carbon atoms, alkyleneoxyalkylene of 2 to 12 carbon atoms, or alkyleneiminoalkylene of 2 to 12 carbon atoms where the nitrogen atom contains as a third substituent, hydrogen or alkyl of 1 to 6 carbon atoms,

R_2 and R_3 each independently is straight or branched chain

alkylene of 1 to 12 carbon atoms; straight or branched chain alkylene of 1 to 12 carbon atoms substituted by one or two of phenyl or cyclohexyl; of R_2 and R_3 are a group of the formula

$C_mH_{2m}(OC_kH_{2k})_r$

where

m is an integer from 1 to 12,

k is an integer from 2 to 6,

r is an integer from 1 to 40.

4,097,643

COMPOSITIONS COMPRISING (1) A COPOLYMER FORMED FROM AN UNSATURATED ACID AND (2) AN EPOXY GROUP-CONTAINING SILANE ARE USEFUL TEXTILE AND PAPER FINISHING MATERIALS

Yoshiyuki Hasegawa, Ichihara, Japan, assignor to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Jan. 7, 1977, Ser. No. 757,707

Claims priority, application Japan, Feb. 5, 1976, 51-10830

Int. Cl.[2] D06M *15/38*

U.S. Cl. 428—270 **7 Claims**

1. An improved resin for resin finishing textiles, fibers and paper which is a composition of matter which consists essentially of (A) copolymeric organic resins which are prepared from unsaturated aliphatic organic acids and an ester selected from the group consisting of (i) acrylic acid esters and (ii) methacrylic acid esters,

the improvement comprising the addition of (B) 0.1–10 weight percent, based on the weight of the components (A) and (B), of a silane which contains epoxy groups.

7. A textile when treated with the composition of claim 4 wherein the textile is selected from a group consisting of cotton, linen, rayon, wool, nylon and polyester.

4,097,644

INORGANIC RAW FELT INTENDED FOR THE PRODUCTION OF ROOF FELT

Harald Thiis Evensen, Porsgrunn, and Ola Tellesbo, Heistad, both of Norway, assignors to Isola Fabrikker A/S, Brevik, Norway

Continuation of Ser. No. 256,427, May 25, 1972, abandoned. This application Aug. 5, 1975, Ser. No. 602,001

Claims priority, application Norway, May 26, 1971, 711988

Int. Cl.[2] D04H *1/08;* C08K *7/14*

U.S. Cl. 428—281 **8 Claims**

1. A raw felt possessing improved strength, flexibility and bulk, for use in producing an asphalted roofing covering, said raw felt comprising an adhesively bonded porous non-woven sheet of an inorganic fibrous material selected from the group consisting of glass fibers, asbestos fibers and mixtures thereof, and 0.5 – 50% by weight, based on the total weight of the raw felt, of finely divided vulcanized rubber particles distributed with said fibrous material.

4,097,645

SYNTHETIC PAPER HAVING GOOD INK ADHESION THERETO

Takashi Toyoda; Yoshio Miyabe, and Masaaki Yamanaka, all of Ibaraki, Japan, assignors to Oji Yuka Goseishi Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1977, Ser. No. 844,482

Claims priority, application Japan, Oct. 22, 1976, 51-126941

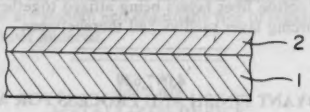
Int. Cl.[2] B32B *3/26, 5/25*

U.S. Cl. 428—306 **13 Claims**

1. A synthetic paper having good ink adhesion thereto which comprised:

A. a synthetic paper substrate comprising a papery layer which is a stretched resin film which contains fine filler particles dispersed therein and has microvoids dispersed therein and surface ruptures thereon; and

B. a layer for improving ink adhesion to the synthetic paper which is provided on at least one surface of the papery



layer and comprises, as an essential constituent, an ethyleneimine adduct of a polyaminepolyamide.

4,097,646

ELECTROSTATIC RECORDING MATERIAL HAVING A DIELECTRIC COPOLYMER COATED LAYER

Makoto Kitahara; Shozo Ishikawa; Kazuharu Katagiri; Tetsuo Arita, and Shoji Masubuchi, all of Tokyo, Japan, assignors to Copyer Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1975, Ser. No. 605,380

Claims priority, application Japan, Aug. 22, 1974, 49-96374; Oct. 11, 1974, 49-116114

Int. Cl.[2] B32B *5/16*

U.S. Cl. 428—323 **10 Claims**

1. An electrostatic recording material comprising a support having on one surface thereof a dielectric layer, which comprises a free carboxylic acid group containing copolymer of (1) about 15 to 70 mol% of methacrylic acid and (2) about 85 to 30 mol% of (a) a methacrylate having at least 6 carbon atoms or (b) an acrylate having at least 7 carbon atoms, said copolymer being water-soluble or water-emulsifiable and up to 10% of said carboxylic acid groups being in the form of an ammonium or amine salt thereof.

4,097,647

LITHOGRAPHIC PRINTING PLATE

Michael J. Shaw, Kalamazoo, Mich., assignor to Allied Paper Incorporated, Kalamazoo, Mich.

Filed Nov. 24, 1975, Ser. No. 634,900

Int. Cl.[2] B41C *1/10;* B41N *1/08;* B32B *13/08*

U.S. Cl. 428—325 **13 Claims**

1. A lithographic printing plate having a lithographic printing surface thereon capable of receiving an ink receptive image comprising a coating in the amount of about 1 to 10 pounds per ream consisting essentially of a fine particle size pigment and a hydrophilic cross-linked cationic resinous binder.

6. A method of making a lithographic printing plate having a lithographic printing surface thereon capable of receiving an ink receptive image comprising preparing an aqueous coating composition consisting essentially of a water-soluble hydrophilic cross-linkable cationic resinous binder and a fine particle size pigment, applying said composition to a paper base in the amount of about 1 to 10 pounds per ream, and drying the composition on said base.

11. A lithographic printing plate having a lithographic printing surface thereon capable of receiving an ink receptive image comprising

a paper base;

a coating on said paper base in the amount of about 1 to 10 pounds per ream consisting essentially of a non-flocculating fine particle size pigment and a hydrophilic cross-linked cationic resinous binder, said pigment and binder being present in the proportions of about 50–90 parts by weight pigment and about 10–50 parts by weight binder; and

said binder being the product of self-crosslinking or cross-linking with about 0.1 to about 10 parts by weight extraneous cross-linker per part of binder.

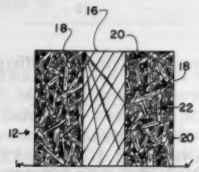
4,097,648
LAMINATED STRUCTURAL MEMBER AND METHOD OF MAKING SAME

John Philip Pringle, Allen, Tex., assignor to Capital Wire & Cable, Division of U.S. Industries, Inc., Plano, Tex.

Division of Ser. No. 548,731, Feb. 10, 1975, Pat. No. 4,016,232, which is a continuation-in-part of Ser. No. 466,242, May 2, 1974, Pat. No. 3,956,541. This application Aug. 16, 1976, Ser. No. 714,628

Int. Cl.[2] B32B *5/16;* B65D *71/00*

U.S. Cl. 428—326 7 Claims



1. A flexible laminated structural member which comprises in combination:

(a) a first layer comprising:

1. from about 30 to about 60 weight percent of a scrap particulate thermoplastic material wherein at least 50 percent of the particles have a particle dimension of from about 1/16 inch to about ¼ inch;
2. from about 70 to about 40 weight percent of a particulate wood filler material;
3. from about 11 to about 18 weight percent of a thermosetting binder, said weight percent based upon the total weight of the particulate thermoplastic material and particulate wood filler material; and

(b) a second layer comprising a sheet material of plywood, fiberboard or the like.

4,097,649
RESIN-IMPREGNATED SELF-ADHERING OR HEAT-SEALABLE PAPERS AND METHOD OF MAKING

Helmut Neumann, Goddelau, Germany, assignor to Röhm GmbH, Darmstadt, Germany

Filed Nov. 10, 1975, Ser. No. 630,328

Claims priority, application Germany, Nov. 16, 1974, 2454496

Int. Cl.[2] C09J *7/04*

U.S. Cl. 428—327 8 Claims

1. A method for making a synthetic resin-impregnated self-adhering or heat-sealable paper which comprises saturating an absorbent paper with an aqueous dispersion of a self-cross-linking synthetic resin, in which dispersion the resin particles have an average particle size of less than 2 microns, and, without drying, applying an aqueous suspension of a thermoplastic resin, in which suspension the resin particles have an average particle size of over 20 microns, to that side of the paper which is to be self-adhering or heat-sealable, and then drying said paper.

4,097,650
MAGNETIC RECORDING MEDIUM

Ryuji Shirahata; Tatsuji Kitamoto; Masaaki Suzuki, and Shinichiro Dezawa, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Aug. 24, 1976, Ser. No. 717,323

Claims priority, application Japan, Aug. 28, 1975, 50-103481

Int. Cl.[2] B32B *15/04;* G11B *5/74*

U.S. Cl. 428—336 11 Claims

1. A non-binder type magnetic recording medium for use in recording at a relative speed, v, to a magnetic reproducing head, comprising a ferromagnetic metal thin film as a magnetic recording layer on a non-magnetic flexible support, in which the surface roughness of the support is between 0.04 and 0.08 μm and the period of the surface roughness is at most $v/10^6$ μm where v is the relative speed between the magnetic head and the magnetic recording medium in μm/sec.

4,097,651
SUBSTRATES COATED WITH END AND INTERMEDIATE REACTION PRODUCTS OF A DIANHYDRIDE AND A HYDRAZINE OR HYDRAZIDE

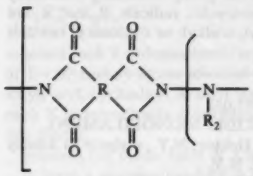
Karl F. Schimmel, Verona, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

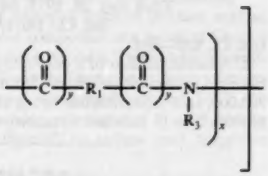
Division of Ser. No. 628,612, Nov. 4, 1975, which is a division of Ser. No. 511,322, Oct. 2, 1974, Pat. No. 4,020,050, which is a division of Ser. No. 369,628, Jun. 13, 1973, abandoned. This application Nov. 16, 1976, Ser. No. 742,306

Int. Cl.[2] B32B *27/04, 27/12, 27/34;* H01B *3/18*

U.S. Cl. 428—375 14 Claims

1. An article of manufacture comprising a polymer consisting essentially of the repeating structural formula:

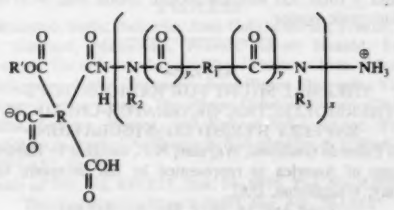




deposited on a substrate; wherein R is a tetravalent organic radical having at least 2 carbon atoms, R_1 is a divalent organic radical selected from the group consisting of alkylene, arylene, or cycloalkyl radicals and x and y are either 1 or 0 and R_2 and R_3 are hydrogen or monovalent alkyl, aryl, aralkyl, or cycloalkyl radicals.

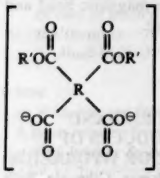
3. The article of claim 1 wherein said substrate is fibrous.

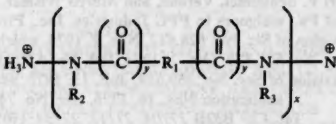
7. An article of manufacture comprising a polysalt coated on a metal substrate wherein said polysalt has therein a moiety of the structural formula:



wherein R is a tetravalent organic radical having at least two carbon atoms, R′ is an aliphatic or cycloaliphatic, monofunctional alkyl radical, R_1 is a divalent organic radical selected from the group consisting essentially of alkylene, arylene, and heterocyclic radicals; R_2 and R_3 are hydrogen or monovalent alkyl, aryl, aralkyl, or cycloalkyl radicals and x and y are either 1 or 0.

11. An article of manufacture comprising a polysalt coated on a metal substrate wherein said polysalt has therein a moiety of the structural formula:





wherein R is a tetravalent organic radical having at least two carbon atoms, R′ is an aliphatic or cycloaliphatic monofunctional alkyl radical having 1 to 20 carbon atoms, R_1 is a divalent organic radical selected from the group consisting essentially of alkylene, arylene, and heterocyclic, radicals, R_2 and R_3 are hydrogen or monovalent alkyl, aralkyl, or cycloalkyl radicals and x and y are either 1 or 0.

4,097,652

POLY (ETHYLENE OXIDE) MONOFILAMENT

Richard Joseph Hartigan, Jr., Delmar, N.Y., assignor to Albany International Corp., Albany, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,666
Int. Cl.[2] D01D *5/10*
U.S. Cl. 428—401 **3 Claims**

1. A monofilament of a poly (ethylene oxide) homopolymer having a molecular weight within the range of from 400,000 to 900,000, said monofilament being characterized by a diameter of from 5 to 15 mils and a tenacity of at least 3.0 gms./denier.

4,097,653

COBALT BORIDE CONDUCTOR COMPOSITIONS

Frank Knowles Patterson, Wilmington, and Joseph Richard Rellick, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 7, 1977, Ser. No. 775,275
Int. Cl.[2] H01B *1/06*
U.S. Cl. 428—433 **19 Claims**

1. Conductor compositions of finely divided inorganic powder dispersed in an inert liquid vehicle, the inorganic powder consisting essentially of 50–100 wt.% Co_xB_y wherein

x is in the approximate range 50–75,

y is in the approximate range 25–50, and

x and y total 100 and are atomic ratios, and 0–50 wt.% inorganic binder.

4,097,654

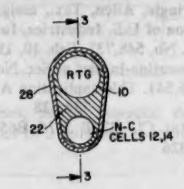
THERMAL SHUNT FOR RADIOISOTOPE THERMOELECTRIC GENERATOR-CHEMICAL BATTERY HYBRID CONFIGURATION

Guido Eddardo Guazzoni, Wayside, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 14, 1977, Ser. No. 787,413
Int. Cl.[2] H01M *14/00*
U.S. Cl. 429—5 **5 Claims**

1. An assembly including a holder and a plurality of electrical energy sources in said holder for supplying a load, said sources having different thermal characteristics comprising:

a block of thermally conductive material having a first cavity accommodating a radioisotope thermal electric generator having a first thermal characteristic and a second cavity accommodating a chemical battery having a second thermal characteristic, said cavities being surrounded by said block, and a layer of thermal insulation disposed on and surrounding said block, said insulation layer trapping heat therein and said block directing heat between



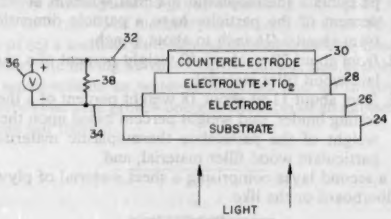
said different sources having said different thermal characteristics.

4,097,655

PHOTOGALVANIC CELL USING A TRANSPARENT CONDUCTING ELECTRODE

Horst Witzke, Princeton, N.J., assignor to Optel Corporation, Princeton, N.J. and Grumman Aerospace Corporation, Bethpage, N.Y., part interest to each

Filed Jul. 16, 1976, Ser. No. 706,078
Int. Cl.[2] H01M *6/30, 6/36*
U.S. Cl. 429—111 **7 Claims**



1. A photogalvanic cell comprising a light passing substrate;

a light transmissive electrode supported by the substrate;

a counterelectrode located in spaced registry from the electrode;

semi-solid electrolyte means containing titanium dioxide positioned between the electrode and the counterelectrode for cooperating therewith to convert impinging light energy to electrical energy and for retaining electrical charge after removal of light.

4,097,656

PROCESS FOR IMPARTING ANTISTATIC PROPERTIES TO PLASTICS

Franz-Josef Dany, Erftstadt; Gerhard Mietens, Efferen, and Erich Schallus, Koln-Klettenberg, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 7, 1976, Ser. No. 674,573
Claims priority, application Germany, Apr. 10, 1975, 2515632
Int. Cl.[2] C08K *3/04*
U.S. Cl. 526—1 **5 Claims**

1. In the process for imparting antistatic properties to plastics by blending a pulverulent plastics material with conductive carbon black and making the resulting blend into a moulding composition, the carbon black having been made by subjecting hydrocarbons, which are liquid at room temperature, to thermal conversion at 1000° to 2000° C, under pressures within the range 1 to 80 atmospheres absolute, and in the presence of oxygen or an oxygen-containing gas, scrubbing the resulting carbon black-containing gas with water and separating the carbon black from the aqueous phase, the improvement which comprises intimately blending the aqueous, carbon black-containing phase with vaporizable liquid aliphatic or

cycloaliphatic hydrocarbons at temperatures within the range 50° and 120° C, under pressures within the range 1 and 20 atmospheres absolute, at a pH-value of 7 to 10, and for a period of 1 to 20 minutes, separating liquid matter from the carbon black and then heating and thereby freeing it from hydrocarbons and water, annealing the carbon black for 20 to 30 minutes at 200° up to 2200° C and blending the carbon black having a water absorption stiffness (AS-number) of 15 to 35, a specific electric resistance of 10^{-1} up to 10^{-3} ohms · cm under a moulding pressure of 100 to 180 atmospheres absolute, a bulk density of 100 to 180 g/liter, and a BET-surface area of 100 to 1000 m^2/g with pulverulent plastics material in an amount of about 4 to 12 weight %.

4,097,657

SURFACE-TREATED SOFT CONTACT LENSES

Charles L. Sieglaff, Mentor; Charles J. Hora, Willoughby Hills, and Joseph P. Tiefenbach, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Apr. 7, 1976, Ser. No. 674,448

Int. Cl.² C08F *8/32, 8/34*

U.S. Cl. 526—30 **8 Claims**

1. A process for producing a soft contact lens resistant to the diffusion and accumulation therein of substances which will promote its clouding and discoloration in use which comprises treating a soft contact lens acrylic ester hydrogel with a compound selected from the group consisting of aliphatic dithiols and aliphatic amines, each of said compounds containing at least one functional group reactive with the polar functional groups in said acrylic ester hydrogel, the treatment being conducted for a sufficient period of time to structurally modify at least a major portion of polymer molecules on the outer surfaces of the hydrogel by incorporating therein the modifying compound through its functional groups.

4,097,658

PROCESS FOR PREPARING COPOLYMERS OF ELASTOMERIC PROPERTIES FROM OLEFINIC MONOMERS

Artur Simon; Gyula Sarosi; Balazs Keszler; Attila Toth, and Maria Rethy, all of Budapest, Hungary, assignors to Muanyagipari Kutato Intezet, Budapest, Hungary

Filed Aug. 16, 1976, Ser. No. 714,655

Claims priority, application Hungary, Aug. 19, 1975, MU 542

Int. Cl.² C08F *4/16*

U.S. Cl. 526—143 **2 Claims**

1. A process for preparing copolymers of elastomeric properties by the polymerization of olefinic monomers with catalysts of hiethyl aluminum and titanium tetrachloride modified by phosgene or acetyl chloride, in a medium of hydrocarbons or chlorinated hydrocarbons, followed by the prcipitation of the obtained polymer with a C_{1-5} alcohol containing an antiageing agent, characterized by using as an olefinic monomer a mixture of isobutylene and butadiene in which the amount of butadiene is between 30% and 95%, the said mixture containing, if desired, at most 20% by weight of butene-1 and/or butene-2, related to the total amount of monomers.

4,097,659

PROCESS OF POLYMERIZING α-OLEFINS IN THE LIQUID PHASE

Henricus M. J. C. Creemers, Geleen; Renier J. L. Graff, Beek(L), and Hendrinus M. Verschoor, Geleen, all of Netherlands, assignors to Stamicarbon, N.V., Geleen, Netherlands

Continuation of Ser. No. 463,432, Apr. 23, 1974, abandoned, which is a continuation of Ser. No. 232,522, Mar. 7, 1972, abandoned. This application Apr. 15, 1976, Ser. No. 677,063

Claims priority, application Netherlands, Mar. 11, 1971, 7103232

Int. Cl.² C08F *4/66, 10/00*

U.S. Cl. 526—151 **26 Claims**

1. In a process for suspension polymerizing at least one α-olefin in the liquid phase at a temperature of about 20° to 100° C. in the presence of a catalytic amount of a Ziegler-type catalyst, the improvement comprising using a catalyst prepared by reacting

(1) a solution of an ether-free inert hydrocarbon solvent in which is dissolved at least one organomagnesium compound of the formula

$$MgR'_2$$

wherein each R′ is independently a hydrocarbyl group of 1 – 30 carbon atoms selected from the group consisting of alkyl, aryl, cycloalkyl, aralkyl, alkaryl and alkenyl,

wherein said MgR'_2 is solubilized in said ether-free inert hydrocarbon solvent by treating said MgR'_2 with an amount of $R''_mAlX'_n$ which is effective to cause the dissolution of said MgR'_2, m being an integer of 1 to 3 and n being an integer of 0 – 2, wherein R″ is alkyl, cycloalkyl, aralkyl, aryl or alkaryl of 1 – 25 carbon atoms and X′ is halogen or alkoxy of 1 – 25 carbon atoms;

with (2) at least one aluminum halogen compound of the formula

$$R_mAlX_{3-m}$$

wherein each R independently represents a hydrocarbyl group of 1 – 30 carbon atoms selected from the group consisting of alkyl, aryl, cycloalkyl, aralkyl, alkaryl, alkenyl and alkadienyl, each X independently represents halogen, and m is a value of less than 3,

wherein the molar ratio of X:magnesium is at least 0.01,

to form a reaction product in the form of a precipitate,

and thereafter mixing the resulting reaction product with at least one transition metal compound of a metal of Groups IV-B, V-B and VI-B of the Periodic Table, which transition metal is substantially in the state of maximum valency, the said transition metal compound selected from the group consisting of halides, alkoxides of 1 – 20 carbon atoms, and mixtures thereof, to reduce said transition metal compound,

and thereafter activating the resulting reduced catalyst system with an activating amount of at least one organo-aluminum compound, said organo-aluminum compound selected from the group consisting of aluminum trialkyls, alkyl aluminum halides, alkyl aluminum hydrides and corresponding compounds wherein one or more alkyl radicals are replaced by alkenyl radicals or alkadienyl radicals, and mixtures thereof, said alkyl radicals and said alkenyl or alkadienyl radicals having 1 – 20 carbon atoms.

4,097,660

HETEROGENEOUS ANIONIC POLYMERIZATION PROCESS

Ilia Rashkov, Sofia, Bulgaria; Jean Golé, Thurins, France; Daniel Guérard, Malzeville, France; Albert Herold, Laxou, France; Gérard Merle, Oullins, France; Ivan Martinov Panayotov, Sofia, Bulgaria; Jean-Pierre Pascault, Villeurbanne, France; Quang Tho Pham, Caluire, France; Christian Pillot, Caluire, France, and Robert Salle, Lyons, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Division of Ser. No. 695,837, Jun. 14, 1976, Pat. No. 4,035,562. This application May 4, 1977, Ser. No. 793,551

Claims priority, application Bulgaria, Jun. 14, 1975, 30292

Int. Cl.² C08F *4/02, 4/08, 36/06, 36/08*

U.S. Cl. 526—173 **5 Claims**

1. A heterogeneous anionic polymerization process, wherein a reaction medium is formed and comprises firstly at least one monomer having a conjugated diene structure, secondly at least one catalyst comprising a carbon with a graphitic structure and at least one element inserted in the latter, that is lithium, and thirdly at least a solvent chosen from the following hydrocarbon solvents, a saturated aliphatic solvant with a

straight or branched chain, and a saturated alicyclic solvant, in which the monomer is dissolved and in which the catalyst is in suspension.

4,097,661

PROCESS FOR PRODUCING CONJUGATED DIOLEFINIC POLYMERS

Koei Komatsu, Yokkaichi; Kenji Itoyama, Ichihara; Jun Hirota, Ichihara, and Akio Nishijima, Ichihara, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd. and Denki Kagaku Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Apr. 18, 1977, Ser. No. 788,351
Claims priority, application Japan, Apr. 19, 1976, 51-43707
Int. Cl.[2] C08F *4/46, 4/56*
U.S. Cl. 526—175 21 Claims

1. A process for producing a conjugated diolefinic polymer by polymerizing at least one conjugated diolefin or copolymerizing at least one conjugated diolefin with at least one vinyl aromatic hydrocarbon in a hydrocarbon solvent in the presence of an alfin catalyst and at least one molecular weight regulator selected from the group consisting of (A) unsaturated halohydrocarbons represented by the general formula, RCX = CYZ, wherein R represents hydrogen, an alkyl group having 1 to 7 carbon atoms, a vinyl group, a phenyl group, a substituted phenyl group, or a halogen atom and X, Y, and Z represent independently hydrogen or a halogen atom, at least one of said R, X, Y, and Z being a halogen atom, (B) halogenated aromatic compounds, (C) ethers, polyethers, and acetals, and (D) tertiary amines, and, if necessary, a dihydro aromatic compound, characterized in that said polymerization or copolymerization is effected in the presence of 0.03 to 0.9 mole of water, an alcohol of the formula, R-OH, where R is a saturated or unsaturated aliphatic or alicyclic group having 1 to 20 carbon atoms, or a mixture of water and the alcohol, per mole of organosodium contained in said alfin catalyst.

4,097,662

CO-POLYMERS OF BUTADIENE AND CARBORANYL METHACRYLATE

Chester W. Huskins, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 29, 1976, Ser. No. 736,806
The portion of the term of this patent subsequent to Oct. 21, 1992, has been disclaimed.
Int. Cl.[2] C08F *2/24, 4/04, 30/06, 230/06*
U.S. Cl. 526—217 3 Claims

1. A method of making a co-polymer having a controlled molecular weight and a relatively low viscosity, said co-polymer consisting in a weight percent range of the monomers carboranyl methacrylate from about 20 to about 90 weight percent and butadiene from about 10 to about 80 weight percent, said method employing an emulsion polymerization process comprising the steps of:

(a) combining said monomers in said weight percent range together in an aqueous mixture containing a weight percent of the total weight of the two monomers, a polymerization initiator of azo-bis-isobutyronitrile up to about 2 weight percent, a chain terminating agent of dodecylmercaptan up to about 10 weight percent to control the molecular weight of said co-polymer by employing a higher weight percent of said dodecylmercaptan when a lower molecular weight co-polymer is made and by employing a lower weight percent of said dodecylmercaptan when a higher molecular co-polymer is made, and an emulsifier of benzylcetyldimethylammonium chloride up to about 10 weight percent;

(b) reacting said aqueous mixture with agitation for a period of time to form said co-polymer;

(c) separating from said mixture said co-polymer thus formed by said reaction by pouring the mixture into a container, acidifying with hydrochloric acid, adding sufficient tetrahydrofuran to separate said co-polymer from the mixture to the tetrahydrofuran, separating said co-polymer contained in said tetrahydrofuran from said mixture, and removing said tetrahydrofuran from said co-polymer which after drying is obtained in a yield approaching 100% as calculated on the basis of the weight of the ingredients used and the weight of said co-polymer recovered.

4,097,663

LOW FUSION COPOLYMER COMPRISING VINYL CHLORIDE, VINYL ACETATE, AND BIS(HYDROCARBYL)VINYLPHOSPHONATE

Ruth E. Gallagher, Dobbs Ferry, and Jagadish C. Goswami, New City, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

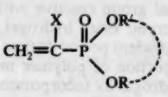
Filed Jan. 29, 1976, Ser. No. 653,313
Int. Cl.[2] C08J *9/00;* C08F *30/02, 4/32*
U.S. Cl. 526—278 5 Claims

1. An emulsion copolymer having a fusion temperature of from about 200° F. to about 300° F. formed by emulsion polymerizing:

a. from about 75% to about 90%, by weight, vinyl chloride;

b. from about 5% to about 15%, by weight, vinyl acetate; and

c. from about 5% to about 15% by weight of a bis(hydrocarbyl) vinylphosphonate of the formula



where X is selected from the group consisting of hydrogen, halogen, cyano, aryl and C_1–C_{18} alkyl, and R and R′ are unsubstituted and substituted C_1–C_{12} alkyl groups.

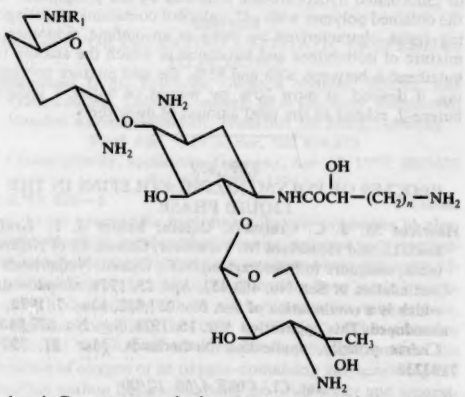
4,097,664

DERIVATIVES OF AN ANTIBIOTIC XK-62-2

Shinji Tomioka, Machida, and Yasuki Mori, Kawasaki, both of Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jul. 12, 1976, Ser. No. 704,750
The portion of the term of this patent subsequent to Feb. 28, 1995, has been disclaimed.
Claims priority, application Japan, Jul. 15, 1975, 50-85767; Jul. 15, 1975, 50-85768
Int. Cl.[2] C07H *15/22*
U.S. Cl. 536—17 8 Claims

1. Compounds represented by the formula:



wherein R_1 represents a hydrogen atom or a methyl group, and *n* is an integer of 1, 3 or 4, and the pharmaceutically acceptable, non-toxic, acid addition salts thereof.

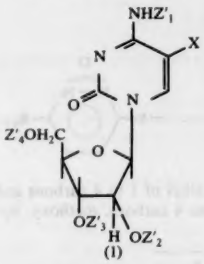
4,097,665

DIACYLNUCLEOSIDES AND PROCESS FOR PREPARING THE SAME

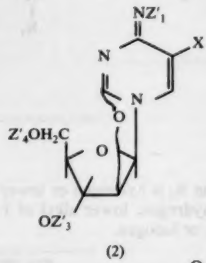
Torao Ishida; Minoru Akiyama; Daikichi Nishimura; Hiroshi Hayashi, all of Fuji; Yoshio Sakurai, Mitaka, and Shigeru Tsukagoshi, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 24, 1975, Ser. No. 634,706
Claims priority, application Japan, Nov. 22, 1974, 49-133556
Int. Cl.[2] C07H *19/08*
U.S. Cl. 536—23 8 Claims

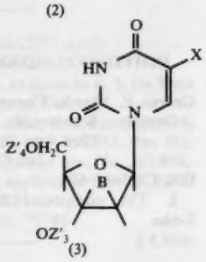
1. A compound selected from the group consisting of compounds represented by the general formulae



(1)



(2)



(3)

wherein

(a) B represents OZ_2' or hydrogen;

(b) one of Z_1', Z_2', Z_3' and Z_4' represents A_1 and another represents A_2 and the remainder represents hydrogen or a protective group wherein

A_1 is C_{14}-C_{22} aliphatic acyl selected from the group consisting of myristoyl, palmitoyl, margaroyl, stearoyl, n-nonadecanoyl, arachidoyl, n-heneicosanoyl, behenoyl, oleoyl, arachidonoyl, or the aliphatic acyl substituted with fluoro, chloro, bromo, iodo, hydroxy, mercapto, phenyl, phenoxy, thiophenoxy, nitrophenyl, cyclohexyl, 2-thienyl, 2-tetrahydropyranyloxy, methoxy, thiomethoxy, carboxymethyl, epoxy and oxo;

A_2 is C_2-C_{14} having carboxy or the acyl substituted with a group selected from the group consisting of phenyl, hydroxy, fluoro, chloro, bromo, iodo, N-carbobenzyloxyamino, cyclohexyl, mercapto, nitro, furane, pyridine, oxo, adamantane, oxymethenylcarboxy and thiomethenylcarboxy; and

the protective group is selected from the group consisting of isopropylidene, ethylidene, benzylidene, tetrahydropyranyl, tetrahydrofuranyl, ethoxyethyl, methoxymethyl, ethoxymethyl, methoxyethyl, triphenylmethyl, 2,4-dinitroanilino, methoxycarbonyl, trichloroethoxycarbonyl, tribromoethoxycarbonyl, formyl, trifluoroacetyl, trichloroacetyl, benzyl, benzhydrine, 2,4-dinitrophenylsulphenyl, propenyl, borate, vinylthioether and benzoylpropyl; and

(c) X is selected from the group consisting of hydrogen, fluorine, chlorine, bromine and iodine;

and pharmaceutically acceptable salts thereof.

4,097,666

SOLVENT SYSTEM FOR POLYSACCHARIDES

Donald C. Johnson, Appleton, Wis., and Myron D. Nicholson, St. Albans, W. Va., assignors to The Institute of Paper Chemistry, Appleton, Wis.

Filed Apr. 29, 1976, Ser. No. 681,561
Int. Cl.[2] C08B *11/02, 16/00*
U.S. Cl. 536—57 23 Claims

1. A composition comprising a natural or modified polysaccharide dissolved in a solvent system comprising dimethyl sulfoxide and formaldehyde.

4,097,667

HYDROXYALKYL CELLULOSE ETHERS

Arno Holst, and Michael Kostrzewa, both of Wiesbaden, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 16, 1976, Ser. No. 751,457
Claims priority, application Germany, Dec. 17, 1975, 2556754
Int. Cl.[2] C08B *11/08, 11/20*
U.S. Cl. 536—87 12 Claims

1. A process for the modification of a cellulose ether containing hydroxyalkyl groups, which comprises the step of reacting said ether with a chloroformic acid ester in an aqueous organic medium containing an alkali metal hydroxide, whereby the cellulose ether is rendered at least partially insoluble in water.

4,097,668

2-[(P-METHOXY-BENZOYL)-HYDRAZONO-FORMYL]-QUINOXALINE-1,4-DIOXIDE

Pal Benko; Ildiko Simonek; Laszlo Pallos; Jeno Kovacs, and Karoly Magyar, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Continuation-in-part of Ser. No. 630,762, Nov. 11, 1975, abandoned. This application Mar. 9, 1977, Ser. No. 775,998
Claims priority, application Hungary, Nov. 21, 1974, EE 2278
Int. Cl.[2] C07D *241/00;* A61K *31/085, 31/165, 31/495*
U.S. Cl. 542—418 1 Claim

1. 2-[(p-Methoxy-benzoyl)-hydrazono-formyl]-quinoxaline-1,4-dioxide and its pharmaceutically acceptable acid addition salts.

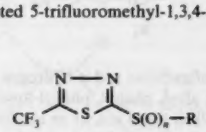
4,097,669

2-SUBSTITUTED-5-TRIFLUOROMETHYL-1,3,4-THIADIAZOLES

Josef Helmut Reisdorff, Wuppertal; Wilhelm Brandes, Cologne; Hans Scheinpflug; Bernhard Homeyer, both of Leverkusen, and Peter Roessler, Bensberg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 14, 1976, Ser. No. 705,375
Claims priority, application Germany, Jul. 26, 1975, 2533604
Int. Cl.[2] C07D *285/12*
U.S. Cl. 542—413 8 Claims

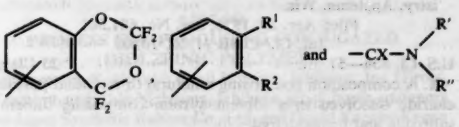
1. A 2-substituted 5-trifluoromethyl-1,3,4-thiadiazole of the formula



in which

R is phenylalkenyl; phenyl monosubstituted in the o- or m-position, polysubstituted phenyl, or substituted phenylalkenyl, the substituents being selected from alkyl with 1 to 4 carbon atoms, halogenoalkyl, halogenoalkylthio or halogenoalkylsulfonyl each with 1 or 2 carbon atoms and 2–5 halogen atoms, alkoxy, alkylcarbonyl or alkoxycarbonyl each with 1 to 4 carbon atoms in the alkyl moiety, hydroxyl, carboxyl, cyano and thiocyano or naphthyl; 5-membered or 6-membered heterocyclic radical with 1 to 4 hetero-atoms elected from N and S atoms; optionally

substituted benzimidiazolyl or benzthiazolyl; optionally substituted naphthyl; quinolyl; cyano or one of the groups



wherein

R^1 and R^2 conjointly are a trimethylene, tetramethylene or pentamethylene group,

X is oxygen or sulfur,

R′ and R″ each independently is alkyl or, together with the nitrogen atom and optionally further hetero-atoms selected from O and N atoms, form an optionally substituted 6-membered or 7-membered ring, and

n is 0, 1 or 1.

4,097,670

CARBOXYALKYLUREIDO CEPHALOSPORINS

Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

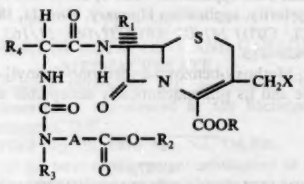
Filed Apr. 5, 1976, Ser. No. 673,222

The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.

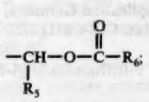
Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—27 **32 Claims**

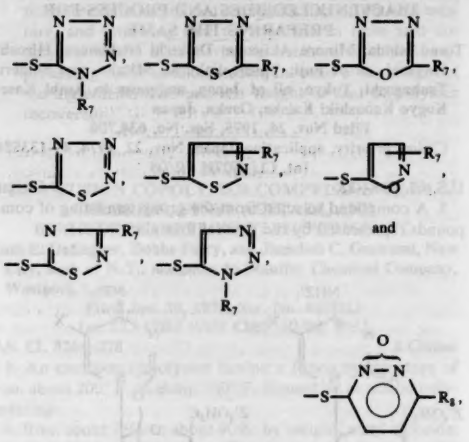
1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl)silyl, trihaloethyl, an alkali metal ion, an alkaline earth metal ion, dibenzylamine, N,N-dibenzylethylendiamine, methylamine, triethylamine, N-ethylpiperidine, or



R_1 is in the α-configuration and is hydrogen or methoxy; R_2 is hydrogen, lower alkyl, phenyl, phenyl-lower alkyl, diphenyl-lower alkyl, an alkali metal ion, or an alkaline earth metal ion; R_3 is hydrogen or lower alkyl; A is straight or branched chain alkylene of 1 to 6 carbons; R_4 is phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, and hydroxy, or a mono substituted or unsubstituted heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl, and 3-furyl wherein said heterocyclic substituent is attached at an available carbon atom and is halogen or lower alkyl of 1 to 4 carbons; R_5 is hydrogen or lower alkyl; R_6 is lower alkyl; and X is heterothio selected from the group consisting of



wherein R_7 is hydrogen or lower alkyl of 1 to 4 carbons and R_8 is hydrogen, lower alkyl of 1 to 4 carbons, methoxy, hydroxy, or halogen.

4,097,671

DIHYDROOXADIAZINONES AND METHOD FOR MAKING

George E. Niznik, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,450

Int. Cl.[2] C07D *273/04*

U.S. Cl. 544—66 **1 Claim**

1. The compound 5-phenyl-3,6-dihydro-1,3,4-oxadiazin-2-one.

4,097,672

PHENYL PYRAZOLE THIOAMIDES

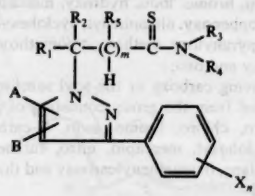
Malcolm W. Moon, and Gabriel Kornis, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 686,548, May 14, 1976, which is a continuation-in-part of Ser. No. 524,231, Nov. 15, 1974, abandoned. This application May 9, 1977, Ser. No. 795,103

Int. Cl.[2] C07D *231/12, 231/16*

U.S. Cl. 548—377 **15 Claims**

1. A compound of the formula:



V

where R_1 is hydrogen, alkyl of 1 to 7 carbon atoms, inclusive, haloalkyl of 1 to 7 carbon atoms, inclusive, phenyl, benzyl or cycloalkyl of 3 to 6 carbon atoms, inclusive, with the proviso that when R_1 is benzyl or cycloalkyl m = 0; R_2 and R_5 are the same or different and are hydrogen, halogen, alkyl of 1 to 6 carbon atoms, inclusive, haloalkyl of 1 to 6 carbon atoms, inclusive, or phenyl; R_1 and R_2 together with the attached carbon atom can be cycloalkyl of 3 to 6 carbon atoms, inclusive, when m = 0, R_1 is not hydrogen and when m = 1 at least one of R_2 or R_5 is hydrogen; R_3 is hydrogen, alkyl of from 1 to 8 carbon atoms, inclusive, phenyl or benzyl; R_4 is hydrogen or alkyl

of from 1 to 6 carbon atoms, inclusive, and R_3 and R_4 can be joined together to form a heterocyclic ring selected from the group consisting of pyrrolidine, or piperidine; A and B are the same or different and are hydrogen, alkyl of from 1 to 6 carbon atoms, inclusive, phenyl, halogen, cyano, haloalkyl of 1 to 6 carbon atoms, inclusive, alkoxy or alkylthio in which the alkyl group is from 1 to 3 carbon atoms, inclusive, or trifluoromethyl and when adjacent can be joined to form a ring of from 5 to 7 carbon atoms, inclusive; where X is halogen, nitro, cyano, acetyl, dimethylcarbamoyl, alkyl, haloalkyl, alkoxy or carboalkoxy in which the alkyl group is from 1 to 3 carbon atoms, inclusive, phenyl, benzyl, 2-phenylethyl and *n* is 0, 1, or 2or an acid addition salt thereof.

4,097,673

HERBICIDAL CARBAMATES AND THIOLCARBAMATES

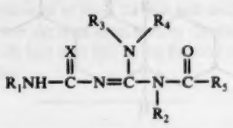
Julius Jakob Fuchs, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 520,114, Nov. 1, 1974, Pat. No. 4,004,915, which is a division of Ser. No. 356,422, May 2, 1973, Pat. No. 3,882,160, which is a continuation-in-part of Ser. No. 312,904, Dec. 7, 1972, Pat. No. 3,823,179. This application Oct. 13, 1976, Ser. No. 732,282

Int. Cl.[2] C07C *149/40, 79/46*

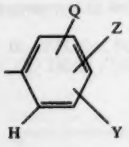
U.S. Cl. 560—16 **1 Claim**

1. A compound of the formula



wherein

R_1 is



wherein

Q is hydrogen, fluorine, chlorine, bromine, a C_1–C_4 alkyl, a C_1–C_2 alkoxy or alkylthio group, nitro or trifluoromethyl group;

Y is hydrogen, chlorine, or methyl; and

Z is hydrogen or chlorine;

R_2 is a C_1–C_3 alkyl;

R_3 is hydrogen, methyl, or ethyl;

R_4 is a C_1–C_4 alkyl, a C_3–C_4 alkenyl, a C_3–C_4 alkynyl, or methoxyl;

R_5 is —OR_6, wherein R_6 is a C_1—C_8 alkyl substituted with 0–3 chlorine atoms or 0–1 methoxyl; and

X is oxygen or sulfur.

4,097,674

2-NAPHTHYLACETIC ACID DERIVATIVES

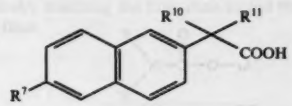
John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Palo Alto, Calif.

Division of Ser. No. 558,874, Mar. 17, 1975, Pat. No. 4,001,301, which is a division of Ser. No. 195,875, Nov. 4, 1971, Pat. No. 3,896,157, which is a division of Ser. No. 694,771, Dec. 7, 1967, abandoned, which is a continuation-in-part of Ser. No. 608,997, Jan. 13, 1967, abandoned. This application Sep. 27, 1976, Ser. No. 727,082

Int. Cl.[2] C07C *63/36, 69/76*

U.S. Cl. 560—100 **6 Claims**

1. A compound of the formula



XIV

wherein:

R^7 is methyl, ethyl, isopropyl, cyclopropyl, trifluoromethyl, vinyl, ethynyl, fluoro, or chloro;

one of R^{10} and R^{11} is hydrogen, the other being methyl or difluoromethyl or R^{10} and R^{11} taken together are methylene or difluoromethylene;

and the corresponding alkyl esters of 1–12 carbon atoms and pharmaceutically acceptable acid addition salts thereof.

4,097,675

8β, 12α, 15β-PGF$_{2\alpha}$ COMPOUNDS

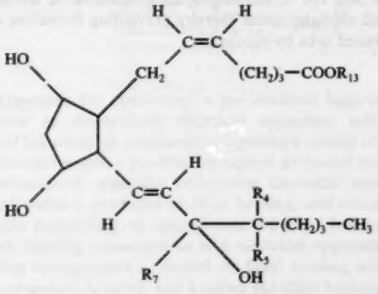
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 518,697, Oct. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 289,317, Sep. 15, 1972, abandoned. This application Feb. 23, 1976, Ser. No. 660,213

Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—121 **9 Claims**

1. An optically active compound of the formula



wherein R_4, R_5, and $R_7$are hydrogen or methyl, being the same or different;

wherein R_{13} is hydrogen, alkyl of one to 10 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof wherein R_{13} is hydrogen.

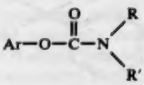
4,097,676

METHOD FOR THE PREPARATION OF AROMATIC URETHANS

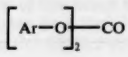
Ugo Romano, Milan, Italy, assignor to Anic S.p.A., Palermo, Italy

Filed Nov. 22, 1976, Ser. No. 744,109
Claims priority, application Italy, Dec. 3, 1975, 29960 A/75
Int. Cl.[2] C07C *125/04, 125/06*
U.S. Cl. 560—132 1 Claim

1. In a method for preparing aromatic urethans of the formula:



wherein Ar is selected from phenyl, naphthyl and alkyl-, aryl-, aryloxy-, halogen- and dialkylamino- substituted derivatives thereof and R and R′ are each selected from hydrogen or lower alkyl comprising reacting an aromatic carbonate of the formula:



with an aliphatic amine of the formula:

wherein Ar, R and R′ are as defined above,

the improvement which consists of effecting the reaction, optionally in the presence of an organic solvent, between 20° and 100° C and employing stoichiometric amounts of said aliphatic amine thereby preventing formation of undesired urea by-product.

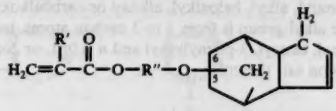
4,097,677

UNSATURATED ESTERS OF GLYCOL MONODICYCLOPENTENYL ETHERS

William D. Emmons, Huntingdon Valley, and Kayson Nyi, Sellersville, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 7, 1976, Ser. No. 703,348
Int. Cl.[2] C07C *69/54*
U.S. Cl. 560—220 7 Claims

1. A compound having the general formula:



(I)

wherein R′ is CH_3 and R″ is selected from the group consisting of:

(a) Alkylene groups having 2 to 6 carbon atoms and

(b) Alkylene heteroalkylene groups wherein the total number of carbon atoms is from 4 to 6 and the heteroatom is O or S.

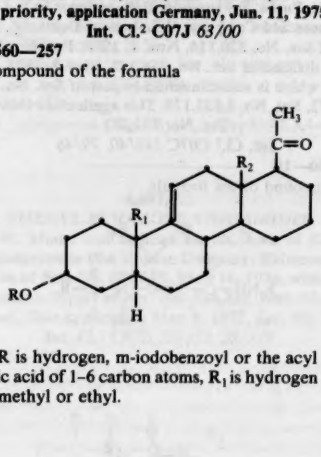
4,097,678

$\Delta^{9(11)}$-5α-D-HOMO-20-KETO STEROIDS

Ulrich Kerb; Rudolf Wiechert, and Otto Engelfried, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Mergkamen, Germany

Filed Jun. 8, 1976, Ser. No. 693,847
Claims priority, application Germany, Jun. 11, 1975, 2526372
Int. Cl.[2] C07J *63/00*
U.S. Cl. 560—257 11 Claims

1. A compound of the formula



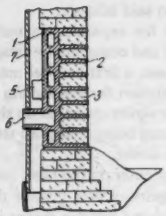
wherein, R is hydrogen, m-iodobenzoyl or the acyl radical of an alkanoic acid of 1–6 carbon atoms, R_1 is hydrogen or methyl and R_2 is methyl or ethyl.

4,097,679

SIDE WALL OF THE ULTRA HIGH POWER ELECTRIC ARC FURNACES FOR STEELMAKING

Ichiro Fukumoto, Kanzaki, and Susumu Hayashida, Himeji, both of Japan, assignors to Sankyo Special Steel Co., Ltd., Japan

Filed Sep. 21, 1976, Ser. No. 725,289
Claims priority, application Japan, Jan. 9, 1976, 51/1585
Int. Cl.[2] F27D *1/12*
U.S. Cl. 13—32 4 Claims



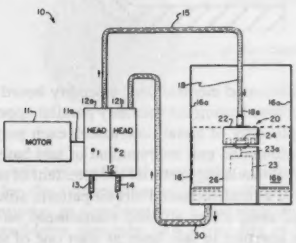
1. A water cooled panel for use as a part of an inside wall within an outer shell in an ultra-high power electric arc furnace, comprising walls forming a panel having a plurality of hollow water channels extending therethrough, said panel having a first side facing toward the outer shell and an oppositely directed second side facing inwardly into the furnace, a water inlet and a water outlet connected to the first side of said panel for flowing water through said water channels, a plurality of fins formed on said second side and extending therefrom inwardly into the furnace, said fins being spaced apart forming multi-sided chambers closed by said second side and said fins and open to the inside of the furnace, a castable refractory deposited into and filling the space within said multi-sided chambers, said fins comprising a plurality of first fins and second fins extending transversely of said first fins, said first fins being at least 10 mm in thickness, said first fins extending horizontally and projecting into the furnace from said second wall for a dimension of at least 70 mm and said first fins being spaced apart in the vertical direction in the range of 30 to 80 mm, and said walls and said fins being formed of one of copper and a copper alloy.

4,097,680

SPINNING DISK ELECTRICAL ISOLATOR FOR A FLOWING SEAWATER STREAM

Cesar Clavell, Jr., San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 10, 1977, Ser. No. 776,144
Int. Cl.[2] H01B *17/00*
U.S. Cl. 174—8 10 Claims



1. An apparatus for breaking the electrical conductivity continuity in a fluid flowing from a source to instrumentation comprising:

drivable impelling means coupled to the source for impelling the fluid therefrom;

means coupled to the impelling means for radially dissipating the fluid in the form of a multitude of separated droplets;

means arranged to collect the multitude of separated droplets for coalescing them into a reservoir of fluid;

drivable expelling means coupled to the reservoir of fluid for expelling the fluid therefrom and to the instrumentation; and

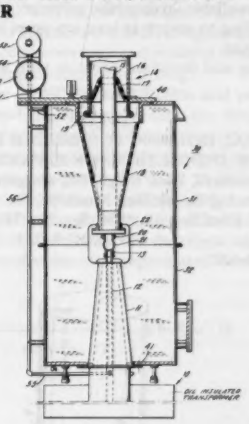
means connected to the drivable impelling means and drivable expelling means for synchronously driving them thereby matching the flow rates to and from the reservoir of fluid.

4,097,681

INTERFACE FOR HIGH VOLTAGE OIL-FILLED AND GAS-FILLED APPARATUS

Edward M. Spencer, Mississauga, Canada, assignor to I-T-E Industries Ltd., Mississauga, Canada

Filed Jan. 31, 1977, Ser. No. 763,833
Int. Cl.[2] H01F *27/04;* H01B *17/26*
U.S. Cl. 174—12 R 6 Claims



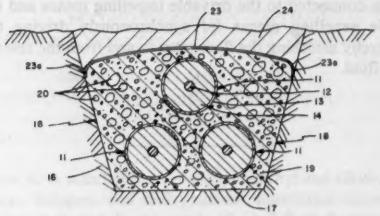
1. Apparatus for connecting a gas-insulated high-voltage conductor to oil-insulated electrical apparatus; said gas-insulated high-voltage conductor comprising a central conductor suspended within a gas-filled elongated grounded housing; said oil-insulated apparatus comprising electrical apparatus disposed within a grounded oil-filled housing; said connecting apparatus comprising an intermediate oil-filled housing, an oil-filled bushing connected to said electrical apparatus and extending through said grounded oil-filled housing and into said intermediate housing, and a sealed gas-filled bushing connected to said central conductor and extending into said intermediate oil-filled housing; the conductors of said oil-filled bushing and of said gas-filled bushing being connected together within said intermediate housing; and pressure differential means for maintaining the oil pressure within said grounded oil-filled housing greater than the oil pressure within said intermediate housing, whereby gas which escapes into said oil in said intermediate housing will not leak into said grounded oil-filled housing.

4,097,682

MEANS FOR PROTECTING UNDERGROUND ELECTRICAL EQUIPMENT FROM THERMAL RUNAWAY

Elijah R. Perry, Portola Valley; Meredith J. Angwin; Mario Rabinowitz, both of Menlo Park, all of Calif., and John F. Shimshock, Somerset, N.J., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Aug. 27, 1976, Ser. No. 718,349
Int. Cl.[2] H01B 7/34
U.S. Cl. 174—15 R 33 Claims



1. In a method for protecting underground heat-generating electrical equipment from thermal runaway, the steps of

(a) laying the equipment in an open trench,

(b) back-filling the trench with soil in which water-absorbent particles are dispersed, said particles comprising a water-swellable, hydrophilic polymer gel material capable of swelling to absorb at least ten times its own weight of water, and

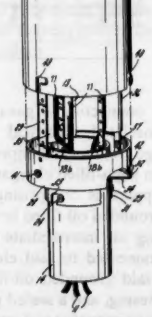
(c) soaking said absorbent particles with water.

4,097,683

TERMINAL HOUSING FOR BURIED ELECTRICAL CABLES AND METHOD OF EXPANDING SAME

Frank C. Summers, Park Ridge, Ill., assignor to Coil Sales & Manufacturing Co., Rolling Meadows, Ill.

Filed Sep. 15, 1976, Ser. No. 723,571
Int. Cl.[2] H02G 9/02
U.S. Cl. 174—38 9 Claims



1. An apparatus for housing surface electrical connections of buried electrical cables and components coupled thereto comprising a base, a first bracket means mounted in upstanding relation on said base for supporting an electrical component vertically above said base, an adapter mounted on said base, said adapter having a component supporting area greater than said base, second bracket means mounted in upstanding relation on said adapter for supporting an additional electrical component above said adapter and base, said second bracket means being positioned at a predetermined angle with respect to said first bracket means to insure proper positioning of an additional electrical component, a cover having an internal chamber, an open lower end and a closed upper end, said cover being mounted on said adapter with said first and second bracket means being received within said chamber to thereby protect them from flooding by air contained within said cover, means for preventing axial movement of said adapter relative to said base, and means for preventing axial movement of said cover relative to said adapter.

9. A method for expanding a surface housing for buried electrical cables and components coupled thereto which housing includes a base, a first bracket means mounted on the base in upstanding relation for supporting an electrical component and a removable cover mounted on the base and enclosing the first bracket means comprising the steps of:

removing the cover,

installing an adapter on the base, said adapter having a component supporting area greater than the base,

mounting a second bracket means in upstanding relation on the adapter for supporting an additional electrical component above the adapter and base,

installing an enlarged cover having an internal chamber, an open lower end and a closed upper end on the adapter with the first and second bracket means being received within the chamber to protect them from flooding, and

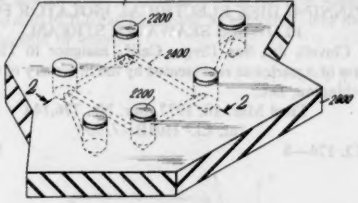
locking the adapter on the base and the enlarged cover on the adapter to prevent axial movement of the adapter relative to the base and the enlarged cover relative to the adapter.

4,097,684

ELECTRIC WIRING ASSEMBLIES

Robert Page Burr, Huntington, N.Y., assignor to Kollmorgen Technologies Inc., Dallas, Tex.

Continuation of Ser. No. 209,626, Dec. 20, 1971, abandoned, and Ser. No. 344,111, Mar. 23, 1973, abandoned, which is a division of Ser. No. 10,039, Feb. 9, 1970, Pat. No. 3,646,572. This application Oct. 8, 1974, Ser. No. 513,190
Int. Cl.[2] H05K 1/00
U.S. Cl. 174—68.5 3 Claims



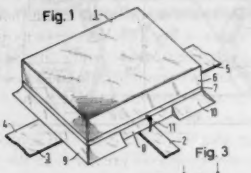
1. A prefabricated electric wire assembly board comprising an insulating base having substantially parallel upper and lower surfaces, a plurality of metal conductors each performed as a continuous elongated unit independent of said base and coated with a layer of insulating material independent of said base and in the form of a predetermined circuit pattern, adhesive means bonding said conductors in fixed relationship on one of said surfaces, an aperture in said base, at least one of said plurality of metal conductors having a conductor end exposed at the wall of the base surrounding the aperture, and a metal terminal in the aperture contacting the wire end, thereby electrically connecting said one surface to the other of said surface.

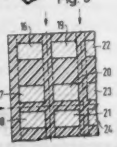
4,097,685

DISCRETE CROSSOVER CHIPS FOR INDIVIDUAL CONDUCTOR TRACK CROSSOVERS IN HYBRID CIRCUITS AND METHOD FOR CONSTRUCTING SAME

Karl Breuninger, Munich; Detlef Haberland, Worthsee, and Roland Herberger, Gottmadingen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 6, 1976, Ser. No. 730,285
Claims priority, application Germany, Oct. 17, 1975, 2546736
Int. Cl.[2] H05K 3/12; H01L 49/02
U.S. Cl. 174—68.5 2 Claims





1. In a discrete, integrated circuit chip forming a conductor crossover wherein the integrated circuit comprises a substrate having a thin-film metal coating on one side, which metal coating is coated with a photosensitive plastic composition which is discontinuous in at least two points for solder points, the improvement comprising:

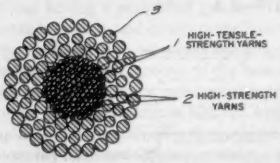
peripheral areas adjacent the crossover point of the conductor paths are free of the metal coating, the plastic coating surrounding said peripheral areas.

4,097,686

OPEN-AIR OR OVERHEAD TRANSMISSION CABLE OF HIGH TENSILE STRENGTH

Jürgen Gladenbeck, Röttgen; Gerald Müller, Cologne; Karl Schörken, Nettetal, Hinsbeck, and Hans-Peter Schwindenhammer, Cologne, all of Germany, assignors to Felten & Guilleaume Carlswerk Aktiengesellschaft, Köln-Mülheim, Germany

Continuation of Ser. No. 695,652, Jun. 14, 1976, abandoned, which is a continuation of Ser. No. 495,121, Aug. 2, 1974, abandoned. This application Jan. 27, 1977, Ser. No. 762,958
Claims priority, application Germany, Aug. 4, 1973, 2339676
Int. Cl.[2] H01B 5/10
U.S. Cl. 174—131 A 4 Claims



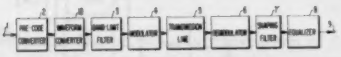
1. An uninsulated-conductor open-air or overhead transmission cable for the transmission of high-voltage electrical energy, comprising, in combination, a plurality of uninsulated electrical conductor elements; and a plurality of tensile-load-bearing elements combined with said plurality of uninsulated electrical conductor elements to form a cable, said tensile-load-bearing elements being made of high-tensile-strength aromatic homo- or copolyamide, and said uninsulated electrical conductor elements constituting the outermost elements of the uninsulated-conductor cable, said plurality of tensile-load-bearing elements being synthetic plastic yarns oriented generally straight and parallel to each other, the yarns being composed of high-tensile-strength aromatic homo- or copolyamide filaments, the cable further including a plurality of highly stretchable synthetic plastic filaments oriented generally straight and parallel to each other, the yarns and the highly stretchable synthetic plastic filaments being bound together to form a unitary core structure.

4,097,687

PARTIAL RESPONSE SYSTEM

Masaru Yamaguchi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1976, Ser. No. 731,960
Claims priority, application Japan, Oct. 14, 1975, 50-123922
Int. Cl.[2] H04L 3/00
U.S. Cl. 178—68 5 Claims



1. In a partial response system including a transmission system adapted to provide an output having a frequency spectrum substantially given by $2j \sin((\omega T/2) \cdot k)$ in response to a single pulse input of pulse width T and of amplitude 1, and a pre-code-converter provided on the input side of said transmission system, thereby to regenerate a bi-level signal applied to the input of said pre-code-converter at the output of said transmission system; the improvement comprising:

a waveform converter inserted between said pre-code-converter and said transmission system, the frequency spectrum of the output of said waveform converter in response to said single pulse applied to the input of said waveform converter being substantially equal to either $2j(1-\cos[(\omega/2) \cdot T])/\omega$ or $2j(1-\cos \omega T)/\omega$, and

said transmission system includes a waveform shaping filter connected to the output of the waveform converter and having a transfer function represented substantially by either

$$\frac{\omega}{1-\cos(\frac{\omega}{2} \cdot T)} \cdot \sin(\frac{\omega T}{2} \cdot k)$$

or

$$\frac{\omega}{1-\cos\omega T} \cdot \sin(\frac{\omega T}{2} \cdot k),$$

where T represents one time slot length, ω represents an angular frequency, and k represents a positive integer.

4,097,688

STEREOPHONIC REPRODUCING SYSTEM

Yoshiaki Ochi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 3, 1971, Ser. No. 195,399
Claims priority, application Japan, Nov. 16, 1970, 45-101767; Nov. 18, 1970, 45-102278
Int. Cl.[2] H04R 5/00
U.S. Cl. 179—1 GQ 1 Claim

1. An audio reproduction system comprising:

left and right input terminals for receiving left and right signals respectively,

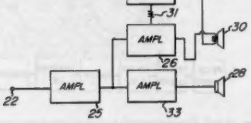
left and right amplifiers having their inputs coupled to said left and right terminals respectively,

front-left and rear-left amplifiers coupled to the output of

said left amplifier, and front-right and rear-right amplifiers coupled to the output of said right amplifier,

front-left and front-right speakers coupled to the outputs of said front-left and front-right amplifiers respectively,

rear-left and rear-right speakers coupled in series between the outputs of said rear-left and rear-right amplifiers, a different one of said speakers being positioned approximately at each of the four corners of a quadrilateral area, which may be occupied by a listener, said speakers directing sound towards the interior of the area, wherein said front-left and front-right speakers are respectively positioned in the left and right front corners of the area behind



the listener and said rear-left and rear-right speakers are positioned in the left and right rear corners of the area facing the listener, and

an impedance element coupling said rear-left and rear-right amplifiers, the impedance of said impedance element having a substantial value capable of supplying partial leakage of a signal amplified by said rear-left amplifier to said rear-right amplifier and partial leakage of a signal amplified by said rear-right amplifier to said rear-left amplifier without degradation of the degree of separation between sound signals supplied to said front-left and front-right speakers, respectively.

4,097,689

OUT-OF-HEAD LOCALIZATION HEADPHONE LISTENING DEVICE

Akitoshi Yamada, Daito; Toshiyuki Goto, Katano; Yoichi Kimura, Suita, and Yoshinobu Kikuchi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 9, 1976, Ser. No. 656,209

Claims priority, application Japan, Aug. 19, 1975, 50-100792; Aug. 27, 1975, 50-104377; Aug. 27, 1975, 50-104378; Oct. 1, 1975, 50-119199

Int. Cl.[2] H04R *5/00*

U.S. Cl. 179—1 G **8 Claims**

3. A headphone device having left and right electro-acoustic transducers comprising:

means for twofold dividing stereo signals of right and left channels to produce four respective direct sound signals;

means including reverberation supply circuits for applying said four direct sound signals to the respective reverberation supply circuits to produce four indirect sound signals;

means for mixing said indirect sound signals with said direct sound signals through respective attenuators to produce four mixed signals; and

means for applying one of the two mixed signals of the right channel and one of the two mixed signals of the left channel to the left electro-acoustic transducer and for applying the others of said mixed signals of right and left channels to the right electro-acoustic transducer of said headphone.

7. An out-of-head localization headphone listening device having left and right electro-acoustic transducers comprising:

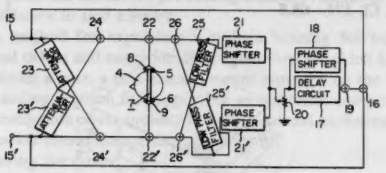
means for mixing two direct sound signals applied from a two channel stereo apparatus;

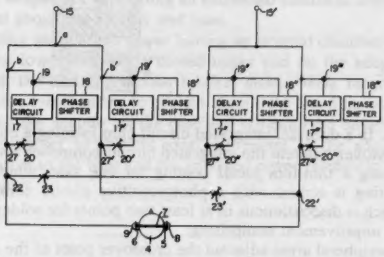
means including a reverberation supply circuit for producing an indirect sound signal by applying said mixed direct signals to said reverberation supply circuit;

attenuator means for attenuating the intensity of said indirect sound signal to control the ratio of the intensity of the attenuated indirect sound signal to said direct sound signal;

means for twofold dividing said indirect sound signal attenuated by said attenuator;

means for mixing each divided indirect sound signal with the





respective direct sound signal to produce two mixed signals to be applied to said left and right electro-acoustic transducers respectively;

first and second attenuators; and

first and second adders receiving respectively said first and second direct sound signals, said first attenuator being coupled to said second adder and said second attenuator being coupled to said first adder for mixing a respective one of said two direct sound signals with the other channel direct sound signal.

4,097,690

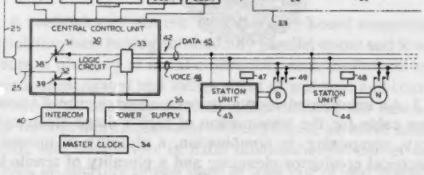
INTERCOMMUNICATION AND ALARM TELEPHONE SYSTEM

Donald L. Kuntz, Wayne, Ill., and David Kent, Palm Harbor, Fla., assignors to Precision Components Inc., Addison, Ill.

Filed Nov. 5, 1976, Ser. No. 739,189

Int. Cl.[2] H04M *11/00*

U.S. Cl. 179—2 A **14 Claims**



1. A telephone system comprising a central unit and a plurality of station units interconnected by at least one transmission channel, means for transmitting a continuous data stream of cyclically recurring control pulses between said units via said

transmission channel, said pulses being divided into uniformly recurring pulse groups with the pulse positions within each group identifying specific command functions, at least some of the pulse positions in each pulse group being dedicated to an identification of any selected one among said plurality of station units which is being individually commanded to perform certain ones of said functions identified by other pulse positions in each pulse group, and means in each of said units for exchanging switching and control information by distinctively modulating individual ones of the pulses in said pulse group according to the command functions embodied in said information, whereby either the individually-commanded station or a group of stations may perform the commanded functions.

4,097,691

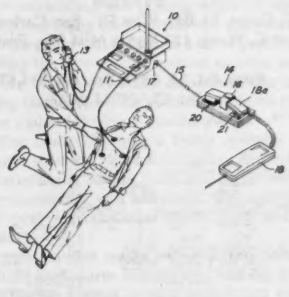
REMOTE TELEPHONE COUPLER AS FOR MEDICAL EMERGENCY DATA TRANSMISSION

Stephen Jeffrey Ehrlich, Sunrise, and Edward Robert Beyer, Pompano Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1977, Ser. No. 812,927

Int. Cl.[2] H04M *11/00*

U.S. Cl. 179—2 C **6 Claims**



1. A portable coupler assembly, self-adjustable for use with any of a plurality of telephone handset configurations, comprising in combination:

a thin base member having at least one cavity in a main surface area, and having a peripheral groove;

circuit means retained within said cavity in the base member;

cable means coupled to said circuit means and adapted to be stored within said peripheral groove of the base member;

resilient coupler means having a substantially flat upper surface, having a central aperture in said flat surface, said coupler being normally positioned within said base cavity and being pivotably mounted for cooperating with any of the handset configurations;

a retaining means attached to said base and having a first position for releasably retaining said handsets in tight contact with said coupler means and a second position for retaining said cable means within said peripheral groove of the base member; and

transducer means coupled to said circuit means and retained within said central aperture of the coupler means for providing audio signal coupling with said retained handsets.

4,097,692

METHOD AND APPARATUS FOR THE TWO-WAY TRANSMISSION OF PULSES

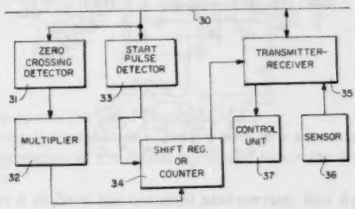
Ernst Felix, Uster, Switzerland, assignor to Zellweger, Ltd., Switzerland

Filed Aug. 25, 1976, Ser. No. 717,681

Claims priority, application Switzerland, Sep. 25, 1975, 12474/75

Int. Cl.[2] H04M *11/00*; H04H *1/14*; H04L *5/00*

U.S. Cl. 179—2.5 R **23 Claims**



14. An apparatus for the two-way transmission of data between a plurality of out-stations connected in common to a power supply network and at least one control unit also connected to said network and including means for applying start pulses to said power supply network at periodic intervals, comprising

modulating means for effecting high frequency modulation of the data to be transmitted, means for coupling the modulated data to the power supply network, means for detecting modulated high frequency signals carried by said power supply network, and means for demodulating said detected high frequency signals;

each out-station including means synchronized to the frequency of said power supply network for generating clock pulses, means responsive to detection of a start pulse carried by said power supply network for counting said clock pulses, and means responsive to detection of an assigned count of said clock pulses for enabling said means for coupling the modulated data to said power supply network.

4,097,693

SWITCHING SYSTEM FOR AN AUTOMATIC TELECOMMUNICATION EXCHANGE WITH A PLURALITY OF INTERMEDIATE LINES THAT ARE GROUNDED WHEN NOT IN USE

Johannes Anton Greefkes, Knegsel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 9, 1976, Ser. No. 694,149

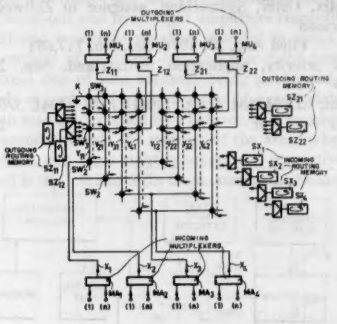
Claims priority, application Netherlands, Jun. 16, 1975, 7507122

Int. Cl.[2] H04J *3/10*

U.S. Cl. 179—15 AT **4 Claims**

1. A switching network for coupling channels of incoming time division multiplex lines to channels of outgoing time division multiplex lines, said network comprising a first switching stage including switches, each switch having one input for each incoming line and a plurality of outputs; a plurality of intermediate time division multiplex lines coupled to said outputs respectively; a second switching stage including switches equal in number to said plurality of outputs of a first stage switch, each switch having a plurality of inputs coupled to said intermediate lines respectively and a plurality of outputs for coupling to said outgoing lines respectively; each of said switches including a plurality of crosspoint elements; circulating routing memory means including address information for each element for time multiplex controlling each of said elements to achieve a given connection in a respective time slot of

a multiplex frame; and means for coupling all of said intermediate lines for at least one half of the duration of said time slots



in which said intermediate lines are not used to a reference potential.

4,097,694

TIME-DIVISION TELEPHONE SYSTEM EMBODYING TRUNKS HAVING DEMODULATING-ADDER CIRCUITS

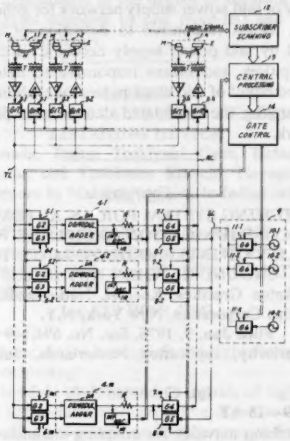
Masami Miyazaki, Toyonaka, Japan, assignor to Toa Electric Company, Ltd., Japan

Filed Jul. 6, 1976, Ser. No. 703,068

Claims priority, application Japan, Jul. 9, 1975, 50-84729; Jul. 28, 1975, 50-92189; Aug. 27, 1975, 50-104435; Sep. 22, 1975, 50-115161; Sep. 26, 1975, 50-116912; Oct. 29, 1975, 50-130643; Nov. 18, 1975, 50-139099

Int. Cl.[2] H04J *3/02;* H04M *3/56*

U.S. Cl. 179—15 AT 12 Claims



1. A telephone exchange system, comprising a plurality of telephone sets each having a microphone and an earphone, means for generating a hook signal in response to a telephone call starting action and means of generating coded information signals, a plurality of pairs of first gates connected respectively to said microphones and earphones, a first line conductor connected in common to the outputs of said first gates connected to said microphones, a second line conductor connected in common to the inputs of said first gates connected to said earphones, a plurality of trunk circuits each including a demodulator-adder circuit for demodulating and then adding the inputs thereof and a coded information receiving circuit connected to the output of said demodulator-adder circuit for receiving selectively said coded information signals from said output, second and third gates connected between said first line conductor and the inputs of said demodulator-adder circuit of said each trunk circuit, a fourth gate connected between the output of said demodulator-adder circuit of said each trunk circuit and said second line conductor, a common signal sound generating device connected to the inputs of said fourth gates through fifth gates respectively, a subscriber scanning device for receiving said hook signal from a first telephone set and producing a subscriber discriminating signal for said telephone set, a central information processing device for storing the statuses of said plurality of telephone sets and trunk circuits and time-division gate control signals which are peculiar to said respective telephone sets, producing a first subscriber information signal corresponding to said first telephone set and a trunk signal for designating a vacant trunk circuit in response to said subscriber discriminating signal and also producing a second subscriber information signal corresponding to a second telephone set which is designated by the output of the coded information receiving circuit of said designated trunk circuit in response to said output and producing sound signal information indicative of the sound signal to be generated by said sound signal generating device, and a gate control device for supplying said time-division gate control signal which is peculiar to said first telephone set to said first gates connected to said first telephone set and to said second, fourth and fifth gates connected to said designated trunk circuit and also supplying said time-division gate control signal which is peculiar to said second telephone set to said first gates connected to said second telephone set and to said third, fourth and fifth gates connected to said designated trunk circuit.

4,097,695

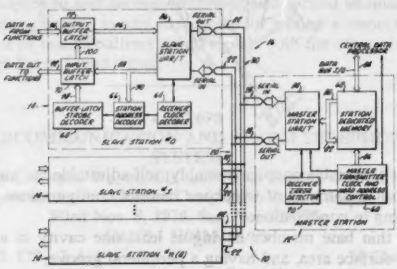
ASYNCHRONOUS ADDRESSABLE MULTIPLEX SYSTEM

Alan G. V. Grace, 11 Bay View Dr., San Carlos, Calif. 94070, and Janet C. Wong, 123 Flying Mist Isle, Foster City, Calif. 94404

Filed Jul. 11, 1977, Ser. No. 814,677

Int. Cl.[2] H04J *6/00*

U.S. Cl. 179—15 BA 8 Claims



1. An asynchronous, addressable multiplex system which comprises:

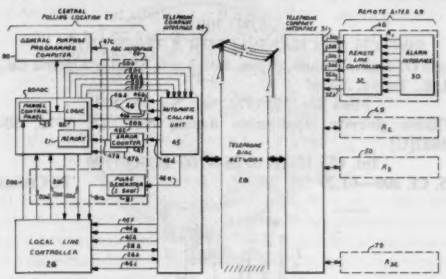
(a) a master station having means for formatting and transmitting a series of outgoing message blocks, each block containing a number of data bytes and a destination address formatted into at least one, but not all, of the bytes, the other bytes being unaddressed, and each block being followed by an intermessage block gap, and

(b) a plurality of slave stations, connected in parallel to the master station, each slave station having an assigned address and each including means for receiving said outgoing message blocks, and means initiated by the intermessage block gap for recognizing and decoding decoding said destination address and for accepting only those message blocks having a destination addresses corresponding to the assigned address.

4,097,696
METHOD AND APPARATUS FOR POLLING SECURITY ALARM INSTALLATIONS

Robert J. Nyhuis, 7806 Maiden La., Portage, Mich. 49081, and Terrence F. Smith, 6903 Blair Rd., Kansas City, Mo. 64152

Filed Sep. 15, 1975, Ser. No. 613,173
Int. Cl.[2] H04M *11/04*
U.S. Cl. 179—2 A 24 Claims



1. Apparatus for polling security alarm installations, each alarm installation having a remote site telephone number and being interconnected with a conventional telephone dial network, said apparatus comprising:

a central monitoring station having the combination of an automatic dial controller means and a local line controller means thereat;

said automatic dial controller means being comprised of a memory unit means for storing remote site telephone numbers, a manual control panel means for entering said telephone numbers in said memory unit means and for displaying said telephone numbers, and logic circuitry means for controlling the polling sequence operation by repeatedly retrieving said remote site telephone numbers from said memory unit means in a set sequence, automatically dialing the retrieved telephone number and requesting delivery of security status information to said central monitoring station from the alarm installation corresponding to the dialed telephone number;

said local line controller means being operable to receive and process security status information delivered to said control monitoring station from said alarm installations;

means interconnecting said automatic dial controller means and said local line controller means with said telephone dial network;

a remote line controller means for collecting security information from said alarm installations and for transmitting said information to said central monitoring station upon request; and

means interconnecting said remote line controller means with said telephone dial network, said automatic dial controller means and local line controller means thereby effecting the polling of each of said alarm installations and said remote line controller means being operable to collect security information and transmit same to said central monitoring station.

4,097,697
DIGITAL SIGNAL PERFORMANCE MONITOR

Stephen George Harman, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

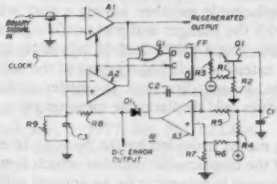
Filed Jun. 2, 1977, Ser. No. 802,376
Int. Cl.[2] H04B *3/46*
U.S. Cl. 179—175.3 R 4 Claims

1. In a performance monitor for a degraded digital signal, an error voltage output circuit comprising:

regenerators for regenerating the degraded digital signal and the degraded digital signal offset against a d-c voltage;

a comparator for detecting parity errors in the digital state between the two regenerated digital signals;

a negative feedback circuit, responsive to the number of parity errors at the output of the comparator, for varying the magnitude of said d-c voltage to maintain a substantially constant error rate between the two regenerated digital signals; and



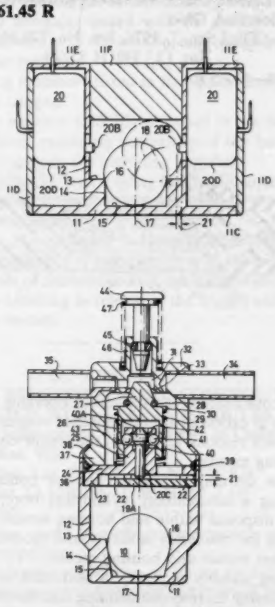
output means for the d-c voltage;

whereby the magnitude of the d-c voltage is a measure of the degradation of the digital signal and hence the error density.

4,097,698
SEISMONASTIC SWITCHES WITH INERTIA RESPONSIVE CONTROLLER

Peter Ronald Jackman, Basingstoke, England, assignor to Inertia Switch Limited, United Kingdom

Filed Mar. 9, 1976, Ser. No. 665,245
Claims priority, application United Kingdom, Mar. 12, 1975, 10344/75
Int. Cl.[2] H01H *35/10*; G01P *15/00*
U.S. Cl. 200—61.45 R 12 Claims



1. A seismonastic control apparatus comprising:

a two-mode control device operable, in different modes, to perform two different control functions and having a plunger which is moveable along a plunger axis and operable on actuating movement along said plunger axis, to effect a change of mode of said control device;

a housing enclosing said control device and defining a concave seat having a circular cross-section and a central axis extending parallel to an imaginary axis which extends parallel to the plunger axis;

a spherical seismonastic roller accommodated in the seat, for unobstructed radial movement from a rest position on the central axis of the seat as a result of a predetermined variation in the resultant of all forces acting on the roller;

a displaceable member supported in spaced relation to the seismonastic roller when the roller is in its rest position, the displaceable member having a part which is engageable with the plunger and parts defining a surface extending transversely of the central axis so that, on a predetermined extent of radial movement of the roller from its rest position, in any direction, the roller strikes said surface and moves said displaceable member away from the seat; and

retaining means provided by the housing to ensure that said part of the displaceable member which is engageable with said plunger is moveable by an amount sufficient to effect said actuating movement of said plunger;

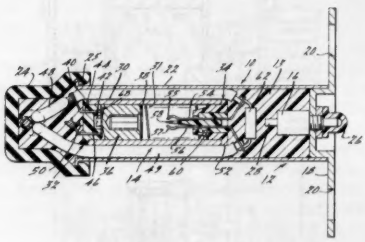
the seat defining a concave surface of revolution extending around said central axis and including a circular region which is engaged by the seismonastic roller during radial movement of said predetermined extent from its rest position and at which region there is an increase in the inclination of the surface of the seat to said central axis so that, in any axial plane, the increased inclination is greater than the inclination of the tangent to the roller at the point of contact between the roller and the seat when the roller is in its rest position.

4,097,699

VISCOUS DAMPED CRASH SENSOR UNIT WITH INERTIA SWITCH

Douglas A. Larson, Oak Park, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 7, 1976, Ser. No. 720,867
Int. Cl.² H01H *35/14*
U.S. Cl. 200—61.45 R **9 Claims**



1. A viscous damped inertial sensor operable to sense velocity changes in excess of a predetermined magnitude for actuating an impact responsive system, the sensor comprising:

A. housing means;

B. means defining a sealed chamber containing gas and defining a substantially cylindrical bore, said chamber being disposed within said housing means;

C. means for resiliently isolating and mounting said sealed chamber within said housing means;

D. a mass slidably received in said bore in closely fitting relationship thereto and defining therebetween an annular gas metering orifice, said mass being movable from a first position in said bore upon said housing means experiencing a change in velocity in the direction of said bore, said mass including switch engaging means;

E. means for preloading and continuously biasing said mass to said first position;

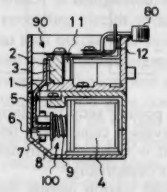
F. electrical switch means disposed in predetermined spaced relationship from said mass in said first position such that, upon said housing means experiencing a predetermined velocity change in the direction of said bore, the resultant inertial force on said mass overcomes said preload and bias and said mass moves in said bore displacing said gas, and said displaced gas flows through said annular metering orifice for providing a predetermined viscous force, retarding the movement of said mass with respect to said bore such that said mass moves from said first position to place said switch engaging means in contact with said electrical switch means only when said velocity change reaches said predetermined magnitude.

4,097,700

SWITCH MECHANISM FOR A TURN SIGNAL

Kunio Okazaki, Hatano, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1976, Ser. No. 728,173
Claims priority, application Japan, Nov. 14, 1975, 50-154807[U]
Int. Cl.² H01H *3/16, 9/00*; B60Q *1/00*
U.S. Cl. 200—61.27 **11 Claims**



1. A switch mechanism for a turn signal comprising:

an operating knob (80) extending in a first direction,

a housing divided into an upper space (90) and a lower space (100) by a partition extending at least partially thereacross, said upper and lower spaces extending one after the other at an angle relative to said first direction,

a first assembly in one of said spaces of said housing, said first assembly including:

a set of fixed contacts (11),

at least one movable contact piece (3),

said operating knob (80) being coupled to said movable contact piece (3) for moving said movable contact piece (3) and

stopper means (2) for holding said movable contact piece (3) at a position moved by said operating knob (80),

bias means (12) for applying a biasing force to said operating knob (80) to cause said operating knob (80) to return to a desired position,

release means (4) for generating a releasing force for releasing the holding force of said stopper means (2), said release means including a solenoid (4) having a movable plunger (6), and said release means being located in the other of said spaces of said housing and in side-by-side relationship with said first assembly, and

transmitting means (1) coupled between said stopper means (2) and said release means (4) for transmitting said releasing force to said stopper means (2), said transmitting means (1) including a lever arm (1), one end of which is mechanically coupled to a said stopper means (2) and the other end of which is mechanically coupled to said plunger (6) of said release means (4).

4,097,701

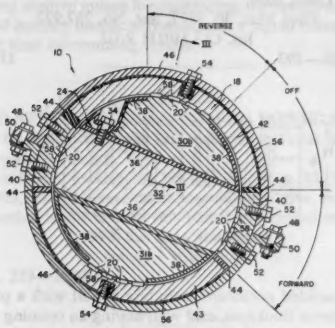
COAXIAL POLARITY REVERSING SWITCH WITH ROTARY ACTUATION

Donald B. Steen, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1977, Ser. No. 764,929
Int. Cl.² H01H *3/00, 19/28*
U.S. Cl. 200—153 S **11 Claims**

1. A coaxial high current switch having rotatable cylindrical

outer switching means, and an inner switching means mounted coaxially of said outer means and operating in conjunction therewith for controlling the flow of current in the conductors of a coaxial cable, with the outer switching means including



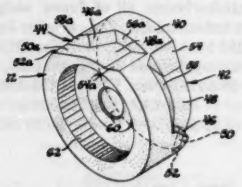
means for connecting the switch to the outer conductors of the coaxial cable, and with said inner means including means for connecting said switch to the inner conductor of the coaxial cable.

4,097,702

CAM ACTUATED SWITCH

Edwin H. Halsted, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 27, 1977, Ser. No. 810,091
Int. Cl.[2] H01H *3/34, 50/64*
U.S. Cl. 200—153 LB **2 Claims**



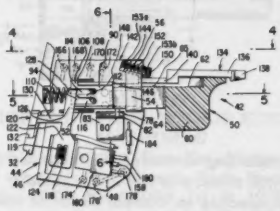
1. A cam actuated reversible switch comprising; a rotatable member adapted to be rotated on an axis in a clockwise and counterclockwise direction having an outer circumferential surface concentric to the axis of rotation; cam means formed on said rotatable member having a substantially radial step portion in a plane oblique to the axis of rotation and a ramp portion, both said oblique step portion and said ramp portion intersecting said outer circumferential surface; and electric contact means having a substantially stationary electrical contact member and a movable electrical contact member having a first spring arm, a second spring arm disposed normal to said first spring arm and a cam follower at the distal end of said second spring arm, said cam follower being maintained in abutment with said rotatable member by said first spring arm, said electrical contact members being maintained in electrical contact when said cam follower is abutting said outer circumferential surface, said electrical contact members being rapidly separated by said first spring arm when said rotatable member is rotated sufficiently in one direction so that said cam follower is permitted to move radially inward by said oblique step portion, said cam follower being maintained in abutment with said oblique step portion by said second spring arm when said rotatable member is rotated in the other direction and said second spring arm and cam follower being moved axially by said oblique step portion to align said cam follower with said ramp portion, said ramp portion forcing said movable contact member radially outward into closing electrical contact with said stationary electrical contact member, said cam follower being moved axially out of alignment with said ramp portion and into alignment with said oblique step portion by said second spring arm when said outer circumferential surface is abutted by said cam follower.

4,097,703

TRIGGER SWITCH AND LOCK MECHANISM THEREFORE

John Martin Houser, Pickens, S.C., assignor to The Singer Company, New York, N.Y.

Filed Aug. 5, 1977, Ser. No. 822,166
Int. Cl.[2] H01H *9/06*
U.S. Cl. 200—157 **17 Claims**



1. A releaseable lock mechanism for a trigger-switch mounted in the handle of a drill housing for activating a motor of a drill, said mechanism selectively to lock the trigger-switch in the activated condition comprising:

(a) a trigger of the trigger-switch slidably connected in the handle and normally biased with the switch off and extending outwardly of the handle, and being depressed to activate the switch,

(b) a camming member affixed in the handle in spaced relation to the trigger,

(c) a locking member shiftably disposed in the handle, and having a lever extending outwardly of the handle and a cam shoe engaging the camming member,

(d) the lever being moved relative the handle to cam the cam shoe against the camming member causing it to shift into a wedge lock against the trigger, and

(e) a resilient means in the housing normally to urge the locking member out of engagement with the trigger and to cause release of the wedge-lock upon slight depression of the trigger resulting in release of the trigger and deactivation of the switch.

4,097,704

INDUSTRIAL REVERSING SPEED CONTROL TRIGGER SWITCH WITH SNAP-IN MODULES

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Aug. 2, 1976, Ser. No. 710,921
Int. Cl.[2] H01H *13/08;* **H02P** *7/00*
U.S. Cl. 200—157 **12 Claims**

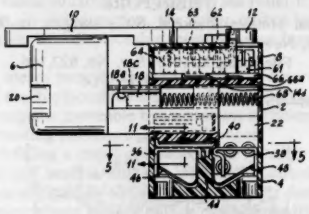
9. A reversing speed control trigger switch of modular construction comprising:

an insulating housing including an upper module having a trigger aperture at the foreward end thereof, and a lower module having a vertically positioned substrate carrying a speed control circuit, said substrate dividing the interior of said lower module into two compartments and extending partially up into said upper module, and double-pole on-off switch contacts mounted in the respective compartments;

snap-in means coupling said lower module to said upper module;

a trigger slidably mounted in said upper module directly above said lower module and extending out through said aperture, said trigger having a channel overlying the upper portion of said substrate including means therein for

operating said speed control circuit, and said trigger having means for operating said on-off switch contacts;
a spring biasing said trigger forwardly;
a reversing switch module on top of said upper module and having reversing contacts and an operating lever extending forwardly above said trigger;
snap-in means coupling said reversing switch module to said upper module;



means for connecting an external circuit to said double-pole on-off switch contacts in said lower module;
means for connecting an external circuit to said reversing contacts in said reversing switch module;
and means connecting said speed control circuit to a contact of said reversing switch.

4,097,705

QUICK LOCK-RELEASE MECHANISM FOR A TRIGGER SWITCH

Don L. Harvell, Greenville, S.C., assignor to The Singer Company, New York, N.Y.

Filed Aug. 5, 1977, Ser. No. 822,162
Int. Cl.[2] H01H 9/06
U.S. Cl. 200—157 **5 Claims**

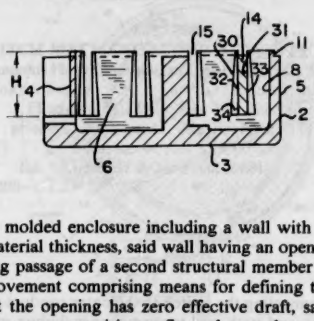
1. A quick lock-release mechanism for a trigger of a trigger-switch mounted in the handle of a drill housing for activating a motor of a drill, said mechanism selectively to lock or release the trigger comprising:
(a) the trigger slidably connected in the handle,
(b) a tapered member affixed in the handle,
(c) a locking member slidably connected to the tapered member and in superposition to the trigger,
(d) a spring disposed between the trigger and the locking member normally to urge each in opposite direction, and
(e) the locking member movable outwardly to be forced by the tapered member into a wedge-lock position against the trigger whereby the trigger-switch is locked "on" and releasable upon slight trigger depression.

4,097,706

MOLDED ENCLOSURE HAVING ZERO DRAFT OPENINGS FORMED IN IT

Joseph T. Roddy, Ballwin, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 30, 1977, Ser. No. 782,922
Int. Cl.[2] H01H 9/02
U.S. Cl. 200—293 **11 Claims**



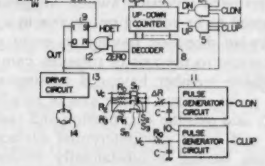
1. In a molded enclosure including a wall with a predetermined material thickness, said wall having an opening in it for permitting passage of a second structural member through it, the improvement comprising means for defining the opening such that the opening has zero effective draft, said opening defining means comprising a first edge, and a second edge oppositely opposed to and spaced from said first edge, each of said first and said second edges including a surface area, said surface area being formed from a part of a conic section, each conic section having at least one line segment parallel to a line segment of the opposed edge, said conic section including substantially the entire thickness of said material thickness.

4,097,707

APPARATUS FOR CONTROLLING HEATING TIME UTILIZING HUMIDITY SENSING

Tetsu Kobayashi; Takato Kanazawa, both of Nara, and Makoto Tsuboi, Yamatokoriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 17, 1976, Ser. No. 687,303
Claims priority, application Japan, May 20, 1975, 50-60751; May 20, 1975, 50-60752; Nov. 17, 1975, 50-138327
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 B **5 Claims**



1. A heating time control apparatus for use in a microwave oven having a heating cavity, heating means for heating food-stuff in said heating cavity, and air blowing means for blowing air into said heating cavity, said heating time control apparatus comprising:
humidity sensing means located in the path of air blown by said air blowing means,
comparison means connected to said humidity sensing means for comparing the sensed humidity with a predetermined humidity level and for generating a signal when the sensed humidity reaches said predetermined level,
heating time determining means for determining the total heating time consisting of first and second heating time periods for said food-stuff, said first time period being measured from the application of power to said heating means until the signal from said comparison means is

received and said second time period corresponding to the product of a heating time coefficient and said first time period, said heating time coefficient being predetermined depending on the type of food-stuff, and

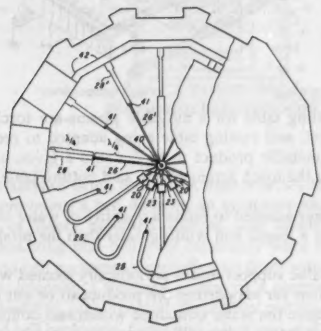
heating control means for controlling the supply of power to said heating means in response to a signal from said heating time determining means.

4,097,708

SOLID STATE MICROWAVE OVEN POWER SOURCE

Samuel H. Bickel, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 497,152, Aug. 13, 1974, Pat. No. 3,953,702. This application Apr. 2, 1976, Ser. No. 673,024
The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 R 10 Claims



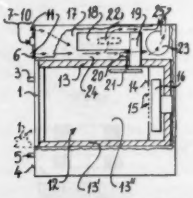
1. A solid state microwave power source comprising a plurality of solid state microwave oscillators and an equal phase power combiner and impedance matching network, said oscillators coupled to input ports of said power combiner whereby the power from each oscillator is coupled to an output port in phase with all the other of said oscillators.

4,097,709

OVEN

Jakob H. Bächtold, Meisterschwanden, and Martin Dahmen, Beinwil am See, both of Switzerland, assignors to Elektromaschinen AG, Horw, Switzerland

Filed Oct. 20, 1976, Ser. No. 734,233
Claims priority, application Switzerland, Dec. 17, 1975, 16327/75
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 R 7 Claims



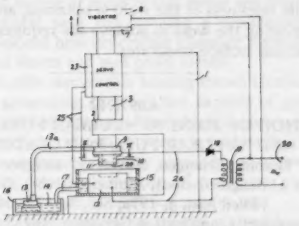
1. A baking oven comprising means defining an oven compartment, means for heating the oven compartment with circulating air, a microwave generator for furnishing the oven compartment with microwaves, said oven compartment including a ceiling, said microwave generator being located above said oven compartment and having an underside, a heat shield provided at the underside of the microwave generator in spaced relationship from the ceiling of the oven compartment, waveguide means closed against the oven compartment substantially airtight but permeable to microwaves in the direction of the oven compartment but otherwise impermeable to microwaves, said waveguide means having air permeable walls, and blower means for feeding cooling air between the heat shield and the ceiling of the oven compartment and in a direction extending transversely through the waveguide means by means of said air permeable walls thereof.

4,097,710

METHOD AND APPARATUS FOR ELECTRICAL MACHINING

Alfred Marie Aimé Maillet, Versailles, Yvelines, France, assignor to Carel Fouche Languepin, Paris, France

Continuation of Ser. No. 600,905, Jul. 31, 1975, abandoned, which is a continuation-in-part of Ser. No. 395,590, Sep. 10, 1973, abandoned. This application Feb. 16, 1977, Ser. No. 769,189
Int. Cl.[2] B23P 1/08
U.S. Cl. 219—69 D 21 Claims



1. A method of machining a metallic workpiece by electro-erosion, comprising the steps of:

positioning an electrode adjacent said workpiece with an intervening gap;

continuously passing a weakly conductive ionizable liquid through said gap; and

periodically energizing said electrode and said workpiece with a unidirectional voltage sufficient to generate ionic discharge pulses with a cadence in a range of substantially 20 to 200 Hz within said liquid in said gap with a spacing sufficient to allow detritus to be swept off, thereby letting the current in said gap substantially decay before each new pulse.

10. An apparatus for machining a metallic workpiece by electro-erosion, comprising:

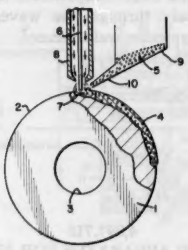
an electrode spaced by a gap from a surface of a workpiece to be machined;

a reservoir containing a weakly conductive ionizable liquid;

pump means for continuously driving said liquid through said gap; and

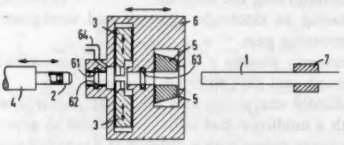
a source of intermittent unipolar voltage pulses with a cadence in a range of substantially 20 to 200 Hz connected across said electrode and said workpiece for periodically energizing said electrode and said workpiece to generate ionic discharge pulses within said liquid with a spacing sufficient to allow detritus to be swept off, thereby letting the current in said gap substantially decay before each new pulse.

4,097,711
ROLLER SHELL HARD COATING
Bani Ranjan Banerjee, Skillman, N.J., assignor to Ingersoll-Rand Company, Woodcliff, N.J.
Filed Sep. 16, 1976, Ser. No. 723,786
Int. Cl.[2] B23K 9/04
U.S. Cl. 219—76.15 12 Claims



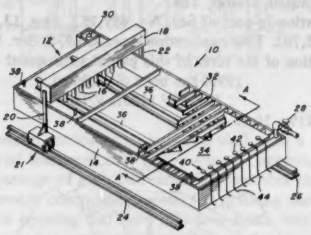
1. A method of hard surfacing a steel roller which comprises:
carburizing the steel surface of the roller to a depth equal to at least half the depth of the hard surfacing required;
applying hard surfacing particles by immersing them in a weld puddle formed on the steel surface from the steel itself by a non consumable gas metal arc welding puddle process so that a uniform dispersion of particles is present in the weld whereby a high effective hardness within the entire thickness of the weld is obtained; and
heat treating the weld to achieve the required properties of base and surface structures.

4,097,712
METHOD OF JOINING NUCLEAR FUEL ROD END CAPS AND NUCLEAR FUEL ROD CLADDING TUBES
Helmut Bezold, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany
Filed Nov. 8, 1976, Ser. No. 739,640
Claims priority, application Germany, Nov. 7, 1975, 2550079
Int. Cl.[2] B23K 11/02
U.S. Cl. 219—107 3 Claims



1. Method of joining fuel rod end caps and fuel rod cladding tubes by resistance pressure welding within a welding chamber, which comprises the steps of bringing a welding device into engagement with an end portion of a rigidly mounted cladding tube, shifting an opened chuck as well as a divided welding electrode, both of which are mounted at one side of the welding chamber, along a predetermined length of the cladding tube end portion and bringing the chuck and the divided welding electrode into contact with the cladding tube end portion, thrusting into the welding chamber from the other side thereof another welding electrode carrying an end cap so that the end cap is fed to the open end of the cladding tube end portion and, after the welding chamber is sealed by sealing members sealingly engaging the cladding tube end portion and the other welding electrode, evacuating the interior of the welding chamber and filling it with protective gas, pressing the end cap onto the open end of the cladding tube end portion, and passing a welding current through the welding electrodes so as to weld the end cap to the end of the cladding tube end portion.

4,097,713
PLASMA ARC CUTTING WATER TABLES
Robert S. Dunshee, Whittier, Calif., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Jan. 21, 1976, Ser. No. 651,484
Int. Cl.[2] B23K 7/06
U.S. Cl. 219—121 P 15 Claims



1. A cutting table for a movable plasma-arc torch cutting arrangement, said cutting table being adapted to receive and support a metallic product to be cut into a given number of sections by the torch arrangement, said cutting table comprising:
a container adapted to retain a quantity of water or the like, having a length and width greater than the product to be cut;
non-metallic support means periodically located within said container for supporting the product to be cut at a level just above the water contained within said container, said support means being self-extinguishing, combustibly non-supportive and being of a material characterized in releasing, to the water in said container, any slag formed as a result of cutting such metallic product; and
means, releasably attachable to such product to be cut, for grounding the product to be cut during the total time the product is being cut, such that plasma-arc torch arrangement may operate.

4,097,714
THERMIONIC HEATER CATHODE ASSEMBLY OF ELECTRON-BEAM GUN
Igor Vladimirovich Shergov, Festivalnaya ulitsa, 75, kv. 108, and Sergei Nikolaevich Melbard, ulitsa Akademika Pavlova, 50, kv. 42, both of, Moscow, U.S.S.R.
Filed May 10, 1977, Ser. No. 795,504
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—121 EB 1 Claim

1. A thermionic heater cathode assembly of a welding electron-beam gun, comprising: a disc cathode made of a highlyemissive material; a U-shaped ribbon filament with a thermionic portion and current-carrying sections arranged in parallel near said disc cathode; a holder connected to ends of the current-

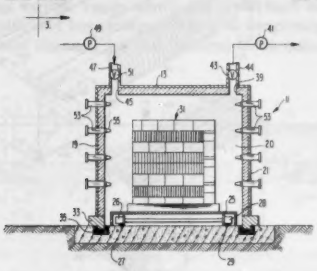
carrying sections of said ribbon filament; the ends of said ribbon filament sections, connected to the holder lying in a plane normal to the ends of the same section, adjoining the thermionic portion of said ribbon filament.

4,097,715

LASER JET BELL KILN

John N. Frizzi, Pittsburgh, Pa., assignor to General Refractories Company, Bala Cynwyd, Pa.

Filed May 16, 1977, Ser. No. 797,343
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 LM **12 Claims**



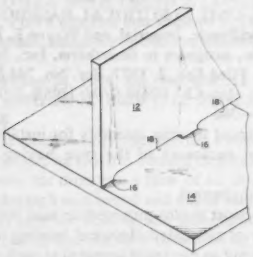
1. A method of firing refractory ware which comprises the steps of providing a bell defining an enclosure and having a plurality of lasers mounted thereon and facing inwardly thereof, lowering said bell over refractory ware to be fired, sealing said bell enclosure, evacuating air from within said bell enclosure, injecting a fluidized system of a chemically inert, non-combustible, high thermal absorption material into said evacuated bell enclosure, firing said lasers into said bell enclosure, said fluidized material absorbing and diffusing the light and heat energy from said laser beams and re-radiating said absorbed energy to thereby heat the bell enclosure and fire said refractory ware.

4,097,716

WELDING METHOD

Walter R. Reichelt, Jr., and Malcolm G. Hoy, both of New Kensington, Pa., assignors to Aluminum Company of America, Alcoa Center, Pa.

Filed Sep. 27, 1976, Ser. No. 726,786
Int. Cl.[2] B23K *9/02*
U.S. Cl. 219—137 R **5 Claims**



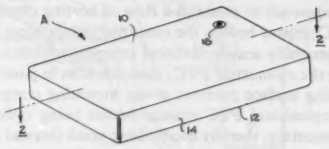
1. A welding method for forming a fillet welded joint comprising the steps of placing an abutting edge of a first metal member onto a surface of a second metal member at generally right angles thereto, the abutting edge having a series of alternating lands and slots extending through the entire thickness of said first member, and arc welding employing a consumable electrode to form a fully penetrated fillet weld from one side only of the joint with the weld filling said slots and melting said lands.

4,097,717

WATER BED MATTRESS WITH REGULATED HEATING MEANS THEREFOR AND CONTROLLING THE HEAT LOSS THEREFROM AND THE METHOD OF MAKING THE SAME

Raymond M. Phillips, 2566 Tuna Canyon Rd., Malibu, Calif. 90265

Filed May 17, 1976, Ser. No. 686,885
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—217 **37 Claims**



1. A water bed mattress with regulated heating means therefor, said water bed mattress comprising:

(a) an upper and a lower sheet surrounded by a peripheral wall to form a water chamber therebetween, said upper and lower sheets and peripheral wall being formed of a foldable flexible plastic material,

(b) panel means formed of an electrically insulative heat conductive foldable flexible plastic material and being heat sealed to one or more of said upper and lower sheets and peripheral wall and forming a substantially completely enclosed heat generating chamber formed by said one of said sheets and said panel means,

(c) an electrically energizable heating means located within said heat generating chamber and capable of generating heat conductively passed through said upper or lower sheets or peripheral wall to water in said water chamber,

(d) connector means operatively provided for connection of said heating means outwardly of said heat generating chamber to a source of electrical power, and

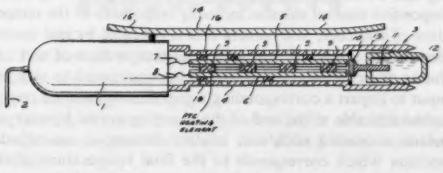
(e) control means operatively associated with said connector means for regulating the heat supplied by said heating means.

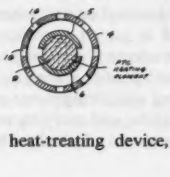
4,097,718

DEVICE FOR HEAT TREATING HAIR ON THE HUMAN HEAD, AND THE LIKE HAIR CURLING DEVICE HAVING SELF-REGULATING PTC HEATER

Hans Joachim Weise, Altenstadt, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 14, 1976, Ser. No. 649,099
Claims priority, application Germany, Feb. 1, 1975, 2504237
Int. Cl.[2] H05B *1/02;* **A45D** *1/02, 2/36*
U.S. Cl. 219—222 **3 Claims**





1. A heat-treating device, particularly for treating hair,

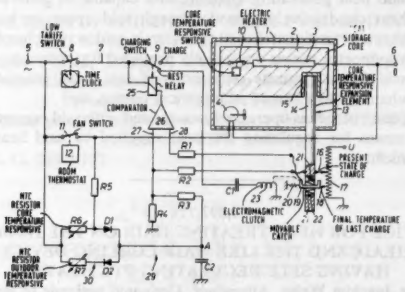
comprising in combination, an outer hair-engaging structure about which hair to be curled or waved can be wound, the hair-engaging structure including holding means for holding hair in position on the hair-engaging structure; a combined heating and temperature regulating means within a cylindrical bore in the hair-engaging structure and including mounting means comprising a pair of mounting components made of thermally and electrically conductive material and defining an intermediate gap, and a plurality of cylindrical PTC resistor bodies located in the gap confined between the pair of mounting components in electrically conductive and thermally conductive engagement with the holding components, said PTC resistor bodies being spaced apart from one another within said gap; and means for applying a voltage across the pair of mounting components to establish a flow of heating current through the PTC resistor bodies, the mounting components being elongated generally semi-cylindrical components electrically connecting the cylindrical PTC resistor bodies in parallel, and the contacting surface portions of the mounting components and of the cylindrical PTC resistor bodies being cylindrical and complementary, thereby establishing good thermal and electrical contact between said contacting surface portions.

4,097,719

CONTROL SYSTEM FOR CHARGING AND DISCHARGING AN ELECTRIC STORAGE HEATER

Gunnar Ernst Rudolf Olsen; Poul Christian Carlos Iversen, both of Nordborg, and Bertel Birker, Sonderborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Aug. 24, 1976, Ser. No. 717,253
Claims priority, application Germany, Sep. 3, 1975, 2539065
Int. Cl.[2] H05B *1/02*; F24H *7/04*; F24D *11/00*
U.S. Cl. 219—364 **7 Claims**



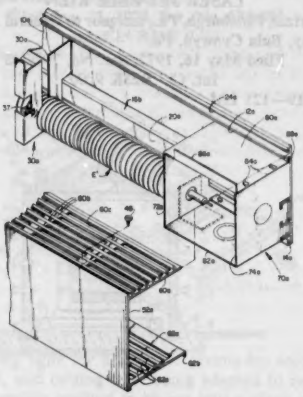
1. An electric storage heater assembly comprising, a heat storage core, a resistance heater for heating said core, a charging switch in series with said heater, a comparator for operating said switch having first and second inputs, a temperature responsive control element movably responsive to the temperature of said core, first control means operated by said control element for sensing the instantaneous temperature of said core during the charging period and being connected to said first input to impart a corresponding signal thereto, second control means movable at the end of the charging period by carrying means associated with said control element to an adjusted position which corresponds to the final temperature of said core for the charging period, said second control means being connected to said second input to impart a corresponding signal thereto, setting means for selectively holding said second control means in said adjusted position during the charging period and means for releasing said setting means after the end of the charging period to allow said carrying means to move said second control means to said adjusted position.

4,097,720

BASEBOARD HEATER

Robert H. Sand, Canton, Conn., assignor to The Vulcan Radiator Company, South Windsor, Conn.

Filed Feb. 11, 1976, Ser. No. 657,099
Int. Cl.[2] F24H *9/08*
U.S. Cl. 219—366 **11 Claims**



1. Apparatus for supporting and housing an elongated heat exchange element, said apparatus comprising an elongated back panel member with a rear face adapted to abut a vertical wall and a front face defining upper and lower integrally formed L-shaped flanges projecting forwardly from and extending the entire length of said back panel member to define vertically spaced channels, at least one support bracket having a vertically extending web oriented transversely with respect to said back panel member, said web provided with an upwardly open slot to receive and support an elongated heat exchange element, said bracket further including upper and lower flanges projecting generally perpendicularly from said web and defining vertically spaced projections, said projections slidably received in said vertically spaced channels of said back panel member, and said back panel member further including forwardly projecting legs also extending the entire length of said panel member and defining a conduit channel therebetween, a cover plate supported by said legs, and said support bracket web being relieved along its rear edges between said upper and lower flanges to accommodate said conduit channel defining legs and cover plate.

4,097,721

MULTIPLE UNIT ELECTRICAL BASEBOARD HEATER

Michael J. DelPercio, Imperial, and Wayne E. Krejci, St. Louis, both of Mo., assignors to Intertherm, Inc., St. Louis, Mo.

Filed Feb. 2, 1977, Ser. No. 764,827
Int. Cl.[2] F24H *9/04*; H05B *3/06*
U.S. Cl. 219—366 **5 Claims**

1. An electrical heating assembly for installation in an elongated cabinet enclosure of the type having a bottom wall, comprising

an inverted channel,

upright support means mounted on said inverted channel,

a plurality of elongated electrical heating units each of the type having an electrical terminal at each end, said heating units being horizontally supported by said upright support means parallel to each other and with their terminals aligned,

a first heat shield outwardly adjacent to one end of said inverted channel and positioned substantially transverse thereto and spaced outwardly from the aligned terminals of said heating units at one end thereof,

a second heat shield outwardly adjacent to the other end of

said inverted channel and positioned substantially transverse thereto and spaced outwardly from the aligned terminals of said heating units,

terminal block connector means supported by said first heat shield in position between said first heat shield and said inverted channel and having two connectors,

parallel circuit means having connections from one connector of said terminal block connector means to the adjacent electrical terminals of said heating units and having return connections from the nonadjacent electrical terminals of said heating units along the underside of said inverted channel to the other connector of said terminal block connector means, said return connections including series safety limit switch means associated with each of said heating units, said connections serving as temporary supports, by said channel, for said terminal block connector means,

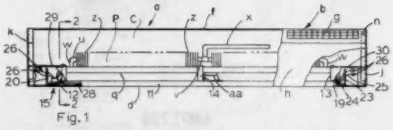


Fig. 1

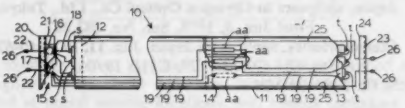


Fig. 3

first line power supply wiring extending from said terminal block connector means and mounting and extending through said first heat shield to a first pair of connector ends outwardly thereof, and

second line power supply wiring extending from said terminal block connector means along the underside of the inverted channel and mounting and extending through said second heat shield to a second pair of connector ends outwardly thereof,

whereby said inverted channel, heat shields, and terminal block connector means of said assembly may each be secured to such bottom wall of such cabinet, the inverted channel and cabinet bottom together forming a wiring raceway, and such cabinet containing said assembly may be field wired to either of said pairs of connector ends.

4,097,722

HAIR BLOWER WITH ORIFICE CONTROL

Norman V. Soler, Port Colborne, and Richard E. DeSisto, Welland, both of Canada, assignors to General Signal Corporation, Rochester, N.Y.

Filed May 24, 1976, Ser. No. 689,211

Int. Cl.[2] A45D *20/12;* **B05B** *1/12;* **F24H** *3/04*

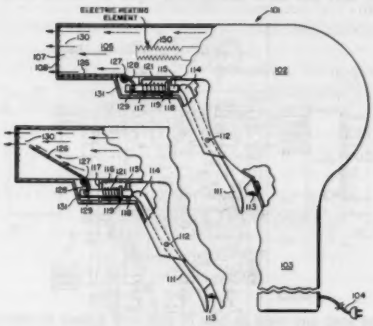
U.S. Cl. 219—368 **8 Claims**

1. In a hand held electric hair dryer having a barrel provided with an exhaust orifice, an electric heating element disposed in said dryer, a blower for directing a flow of air over said heating element and through said barrel and out of said orifice, and a pistol type hand grip for holding and manipulating the hair dryer to aim the orifice and the flow of heated air in a desired direction, the improvement comprising:

(a) damper means downstream of the heating element and supported in the barrel in the vicinity of the orifice and pivotally movable between first and second positions providing maximum and minimum effective orifice openings for producing a dispersed and concentrated air flow, respectively;

(c) resilient biasing means coupled to said damper means for normally biasing said damper means to said first position for normally providing a maximum effective orifice opening;

(c) trigger means positioned immediately adjacent the pistol type hand grip for selective actuation between first and second limits by a digit of the hand holding said hair dryer by the hand grip during use of the hair dryer; and



(d) means coupling said trigger means to said damper for selectively moving said damper against the bias of said biasing means from said first to said second position in response to the movement of said trigger means from said first to said second limit; and wherein

(e) the angle formed between said damper means and the barrel wall, on the downstream side of the pivot point of said damper, is acute.

4,097,723

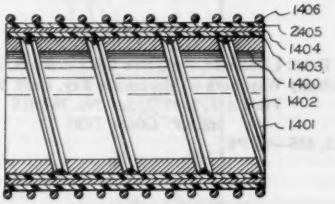
THERMAL SYSTEMS INCORPORATING APPARATUS AND METHODS FOR SIMULATING TIME RELATED TEMPERATURES

Frank W. Leitner, 3732 Pomfret La., Charlotte, N.C. 28211, and Bobby B. Childress, 145 Shadow La., Charlotte, N.C. 28210

Division of Ser. No. 151,563, Jun. 9, 1971, Pat. No. 3,825,725, which is a division of Ser. No. 779,778, Nov. 29, 1968, Pat. No. 3,586,830. This application Jul. 22, 1974, Ser. No. 490,746

Int. Cl.[2] H05B *1/02*

U.S. Cl. 219—494 **8 Claims**



1. The method of remotely obtaining at least one thermal condition of a load supplied heat over a primary path by a heat source comprising the steps of,

supporting electrical heating means adjacent to said load by common support means for the heating means and the load;

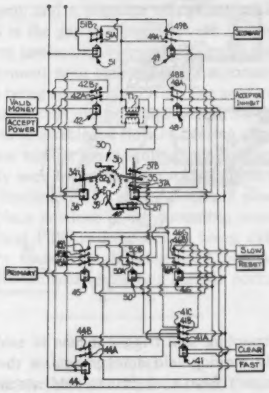
establishing a heat path at least partly different than the primary path having at least a stable thermal parameter known relative to the corresponding thermal parameter of the primary path to the load; and,

sensing at a point along the heat path to develop control signals for regulating the heat source to provide optimum load control.

4,097,724
FUEL VENDING APPARATUS AND METHOD

Ronald E. Roberson, Ayden, N.C., assignor to Quick Fill, Inc., Ayden, N.C.

Filed Mar. 9, 1977, Ser. No. 775,832
Int. Cl.[2] G06M 3/12
U.S. Cl. 235—92 FL 19 Claims

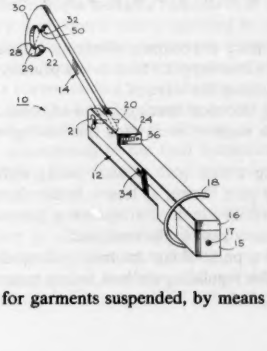


1. In apparatus for vending liquid fuel and having an electrically driven pump means for dispensing fuel, counter means for adding and subtracting credit units and electrically connected for controllably energizing said pump means, money acceptor means for signalling said counter means to add credit units, and a primary dispensing switch means operatively responsive to the dispensing of fuel for signalling said counter means to subtract credit units, the combination therewith of means for guarding against improper dispensing of gasoline and comprising fail-safe circuit means electrically connected with said counter means and said acceptor means and said primary switching means and operably for selectively disabling said pump means from delivering fuel, and secondary dispensing switch means operatively responsive to the dispensing of fuel for signalling said fail-safe means, said fail-safe means responding to signalling by said secondary switching means and abnormality in normal sequential operation of said counter means and said primary switching means by disabling fuel delivery.

4,097,725
GARMENT COUNTER

Frank David Lieberman, and Herb Lou Goodman, both of 4676 Admiralty Way, both of Marina del Rey, Calif. 90291

Filed Apr. 1, 1977, Ser. No. 783,818
Int. Cl.[2] G06M 7/00
U.S. Cl. 235—92 PK 8 Claims



1. A counter for garments suspended, by means of hangers having tip portions, from a rail having a lower surface, including:

a wand, said wand having, at one extremity thereof, a slide portion, said slide portion being adapted to engage the lower surface of said rail;

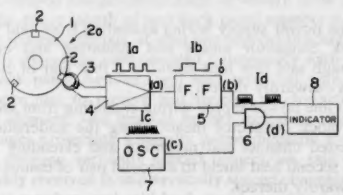
a light source and a light sensor supported in said wand in aligned relationshp with each other to form a light path, said source and sensor being positioned in said wand so as to have said light path interrupted by said tip portions when said slide is moved along the lower surface of said rail; and,

counting means coupled to said sensor for counting the interruptions of said light path by said tip portions as said wand is moved on said slide portion along said lower surface of said rail.

4,097,726
TAPE ENDING INDICATOR FOR TAPE RECORDER

Ken Satoh, Hachioji, and Yoshio Tomizawa, Tama, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1975, Ser. No. 583,267
Claims priority, application Japan, Jun. 11, 1974, 49-67869[U]
Int. Cl.[2] G06M 1/27; G11B 19/06, 15/54
U.S. Cl. 235—92 MP 2 Claims



1. A tape ending indicator for a tape recorder, comprising:

a rotating member operatively connected to a supply or take-up reel of a tape recorder and adapted to rotate at a speed proportional to the rotational speed of said supply or take-up reel;

a plurality of magnets mounted on and spaced at equal intervals along the periphery of said rotating member;

a magnetic head disposed adjacent to the periphery of said rotating member for generating a pulse signal each time one of said magnets passes said magnetic head;

a flip-flop circuit responsive to said pulse signal, the output of said flip-flop changing each time said pulse signal is applied thereto;

a count pulse generator for producing count pulses of a fixed frequency, the frequency of said count pulses being substantially greater than the frequency of said pulse signals generated by said magnetic head;

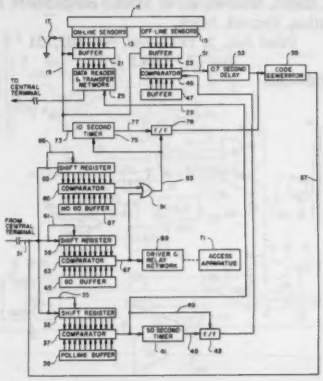
gate means connected to said flip-flop circuit and said count pulse generator for passing said count pulses whenever said gate means is enabled by said output of said flip-flop circuit whereby the number of count pulses passed by said gate means is proportional to the frequency of pulses generated by said magnetic head;

indicator means for counting the number of pulses passed by said gate means and for providing an indication that a terminal end of a tape is approaching when the number of count pulses passed by said gate means reaches a predetermined value.

4,097,727
CIRCUIT FOR CONTROLLING AUTOMATIC OFF-LINE OPERATION OF AN ON-LINE CARD READER

Bryan D. Ulch, Valencia, Calif., assignor to A-T-O Inc., Willoughby, Ohio

Filed Sep. 1, 1977, Ser. No. 830,002
Int. Cl.[2] G06K *5/00*; H04Q *3/00*
U.S. Cl. 235—382 **17 Claims**



1. A security system in which coded cards are scanned at plural remote terminals to determine whether access will be permitted at plural remote locations, said system including a central processor connected to said plural remote terminals and sequentially polling said plural remote terminals to permit said remote terminals, in sequence, to transmit card data to said central processor, said central processor transmitting entry authorization or denial data to said remote terminals in response to said card data, said system comprising:

means at one of said remote terminals for producing a start signal in response to transmission of said card data;

means at said one of said remote terminals for measuring a predetermined elapsed time period after said start signal;

means responsive to said elapsed time measuring means for producing a mode change signal whenever no entry authorization or denial data is received at said one of said remote terminals during said predetermined elapsed time period; and

means responsive to said mode change signal for permitting selective access in response to data on said coded cards at said one of said remote terminals without receipt at said terminal of said entry authorization or denial data from said central processor.

4,097,728
APPARATUS FOR PROVIDING AND SENSING CODED INFORMATION

Leonard J. Genest, Huntington Beach, and Daryle Messner, Buena Park, both of Calif., assignors to Monitron Industries, Santa Ana, Calif.

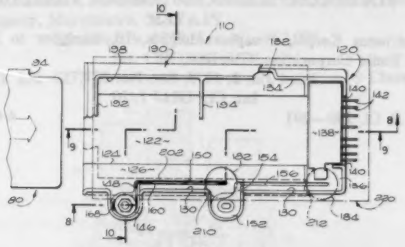
Continuation-in-part of Ser. No. 430,247, Jan. 2, 1974. This application Nov. 13, 1975, Ser. No. 631,558
Int. Cl.[2] G06K *7/08, 19/00*
U.S. Cl. 235—439 **11 Claims**

1. A card for providing coded information to means for receiving and sensing the information, wherein said means comprises at least one sensing coil and means for positioning the card in relation to the at least one coil, said card comprising:

a substrate of electrically non-conductive, non-magnetically reactive material; and,

a layer of magnetically reactive material adapted to be encoded by the selective removal of a portion of said magnetically reactive material from at least one of a plurality of data positions, said data positions being arranged in a predetermined pattern, said at least one data position being adapted to be aligned with and positioned adjacent said at least one coil,

said layer of magnetically reactive material overlying at least a first portion of one side of the substrate, said substrate having a second portion of said one side which when folded about an edge contiguous with the first portion

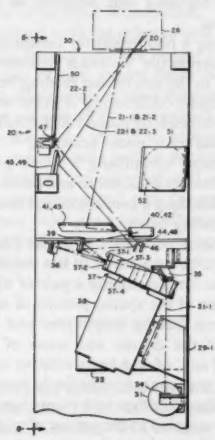


covers at least a first side of said at least one data position without increasing the amount of magnetically reactive material at said at least one data position, at least one of said portions of the substrate having means for securing the portions together in a folded position to form a composite card with said magnetically reactive layer substantially between said two portions of the substrate.

4,097,729
SCANNING SYSTEM AND METHOD

Lawrence Seligman, Shirley; James P. Ballard, Westboro, and Edwin A. Jeffery, Natick, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed May 27, 1975, Ser. No. 581,151
Int. Cl.[2] G06K *7/14*; G08C *9/06*
U.S. Cl. 235—467 **18 Claims**



1. A scanner for converting a visual indicia coded pattern into electrical signals which comprises a source of light providing a coherent light beam, a polygon having a plurality of sets of reflecting surfaces positioned about the periphery thereof, means for rotating said polygon, means for directing the coherent light beam to each of said polygon reflecting surfaces one at a time as said polygon is rotated, a first set of reflecting means for generating a first scanning pattern of a first configuration, a second set of reflecting means for generating a second scanning pattern of a second configuration which is different

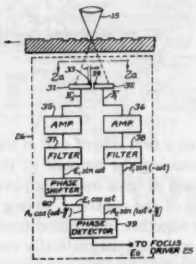
than said first configuration, a different set of said reflecting surfaces of said polygon providing the coherent light beam for each of said sets of reflecting means in order to generate each of said patterns, and wherein said first pattern comprises two trace lines and said second pattern comprises three trace lines.

4,097,730

FOCUS CORRECTION SYSTEM FOR VIDEO DISC PLAYER

Adrianus Korpel, Prospect Heights, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 2, 1975, Ser. No. 592,710
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—201 **4 Claims**



1. In an optical reproducing system in which a multi-turn storage track of a video record is scanned by a focused reading beam of energy to derive information stored in said track, such information including a frequency modulated carrier signal and a focus-servo pilot signal having a frequency which is low relative to that of said carrier and exhibiting the same spatial phase distribution in each turn of said track, a focus correction system comprising:

a displaceable focusing lens disposed in the path of said reading beam;

means, including a photoreceptor comprising first and second light responsive elements symmetrically disposed with respect to the axis of said reading beam and arranged in a spaced apart confronting relation with the gap separating said elements disposed substantially normal to that portion of said track under scansion,

each said element comprising a mask portion extending across said element adjacent to and paralleling said gap for effectively shielding a predetermined area of said element from said reading beam,

said elements being positioned in the far field of said reading beam so as to be responsive to the scanning of said track by said beam for developing a pair of signal components representative of the spatial pattern of said pilot signal,

said components having amplitudes and a phase relation indicative of the degree and sense of the out-of-focus condition, if any, of said beam relative to said track, with one of said components effectively constituting a reference signal for the other said component;

a phase shifter coupled to the output of said first element for shifting the phase of said signal component developed by said first element with respect to said signal component developed by second element an amount sufficient to establish, in the absence of an out-of-focus condition, said components as a pair of quadrature related signals;

a synchronous detector responsive to said pair of quadrature related signal components for developing a focus-error correction signal having an amplitude and polarity determined by the degree and sense of out-of-focus condition;

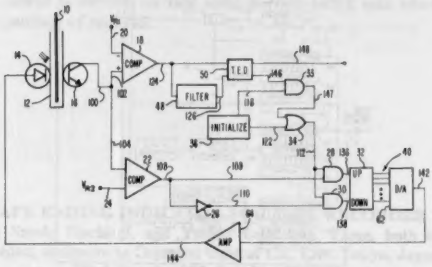
and actuating means coupled to said focusing lens and responsive to said correction signal for displacing said lens an amount and in a direction proportional to the amplitude and polarity of said correction signal to maintain said beam focused on said track.

4,097,731

AUTOMATIC GAIN CONTROL FOR PHOTOSENSING DEVICES

Thomas R. Krause, Troy; Eugene E. Paananen, Brighton, and John F. Burcz, Detroit, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 2, 1977, Ser. No. 802,731
Int. Cl.[2] G01J *1/32*
U.S. Cl. 250—205 **18 Claims**



1. A self-regulating beam-of-light sensor device for sensing the presence of an object in a sensing station comprising:

a light source having its output directed at the sensing station;

a phototransducer means, disposed in aligned relationship with said light source and responsive to the output thereof, for developing a detection signal in accordance with the presence of an object in the sensing station;

first comparator means for comparing the detection signal with a first reference signal level and outputting a signal representing the presence of an object when the detection signal exceeds the first reference signal;

second comparator means for comparing the detection signal with a second reference signal level and outputting a count signal of a first level if the second reference signal exceeds the detection signal, and of a second level if the detection signal exceeds the second reference signal;

counter means, responsive to the output of the second comparator means, for decrementing a stored count if the count signal is of the first level, and incrementing the stored count if of the second level; and

feedback means, responsive to the stored count of the counter means, for regulating the output intensity of the light source in accordance with the stored count to compensate for extraneous factors affecting the intensity of the source.

4,097,732

AUTOMATIC GAIN CONTROL FOR PHOTOSENSING DEVICES

Thomas R. Krause, Troy; Eugene E. Paananen, Brighton, and John F. Burcz, Detroit, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 2, 1977, Ser. No. 802,711
Int. Cl.[2] G01J *1/32*
U.S. Cl. 250—205 **10 Claims**

1. A self regulating beam-of-light sensor device for sensing the presence of an object in a sensing station comprising:

a light source having its output directed at the sensing station;

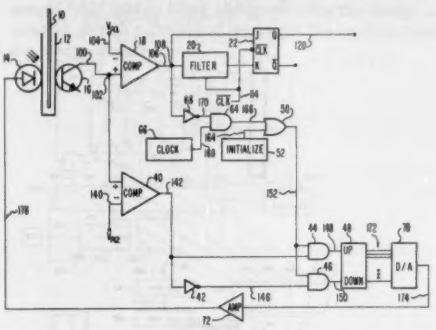
phototransducer means, disposed in aligned relationship with said light source and responsive to the output thereof, for developing a detection signal in accordance with the presence of an object in the sensing station;

first comparator means for comparing the detection signal

with a first reference signal level and outputting a signal representing the presence of an object when the detection signal exceeds the first reference signal;

second comparator means for comparing the detection signal with a second reference signal level and outputting a count signal of a first level if the second reference signal exceeds the detection signal, and of a second level if the detection signal exceeds the second reference signal;

counter means for storing an adjustable count having a



proportional relationship to the intensity of the output of the light source;

feedback means, responsive to the stored count of the counter means, for energizing the light source in proportion to the stored count;

clock means for outputting a stream of periodic clock pulses; and

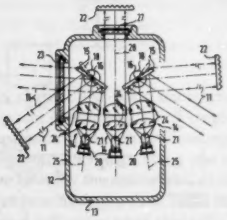
gating means for adjusting the stored count upward or downward for each clock pulse in accordance with the output signal level of the second comparator means.

4,097,733

DOOR SECURING LIGHT BARRIER

Erwin Langenbach, Waldkirch-Buchholz, and Karl-Hans Sackmann, Erzgrube, both of Germany, assignors to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik, Waldkirch, Germany

Filed Sep. 30, 1976, Ser. No. 728,073
Claims priority, application Germany, Oct. 29, 1975, 2548465
Int. Cl.[2] G01D *21/04*
U.S. Cl. 250—221 **14 Claims**



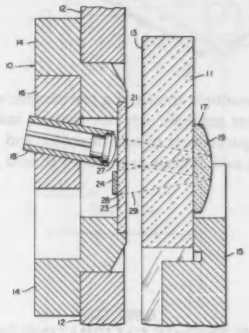
1. A door securing light barrier system comprising: a casing, a plurality of optically active devices in said casing adapted to direct a light barrier beam through at least a part of a door opening, and including at least one light beam transmitting device fixed in said casing, and a passive reflector pivotable about two axes perpendicular to each other for adjusting the angle of the light beam of the light beam transmitting device relative to said casing, one of said devices emitting an electrical signal when the light barrier beam is broken, said light beam transmitting device being combined with a light receiver in an autocollimation system, said casing being adjustable along a vertical axis and being pivotable about said vertical axis.

4,097,734

ZERO INDEX FOR ELECTRO-OPTICAL MEASURING DEVICE

Kent E. Erickson, Brookside, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Feb. 9, 1977, Ser. No. 767,082
Int. Cl.[2] H01J *3/14*
U.S. Cl. 250—237 G **9 Claims**



1. In a measuring system having at least two bodies arranged for close relative movement therebetween in the course of effecting such measure, an improved zero index device capable of providing a distinct indicator of a precise zero datum in said measuring course, said index device comprising:

(a) means associated with one of said bodies for projecting the image of a pair of parallel illuminated slots;

(b) a pair of photoelectric sensors having respective finite fields of view of incident illumination;

(c) means associated with the other of said bodies for directing respective ones of said slot images to incidence upon respective ones of said sensor fields of view in such a manner as to effect, with relative movement between said bodies in the vicinity of the designated zero datum position, an increase in the area of illuminated field of one of said sensors concurrently with a decrease in the area of illuminated field of the other of said sensors, whereby, precisely at said designated zero datum position, the respective sensor fields are equally illuminated; and

(d) means electrically to ascertain said equal illumination of said sensor fields and to provide an indexing signal indicative thereof.

4,097,735

TESTING THE OPERATION OF A RECORDING FLUOROMETER/DENSITOMETER

Donald P. Brezinski, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

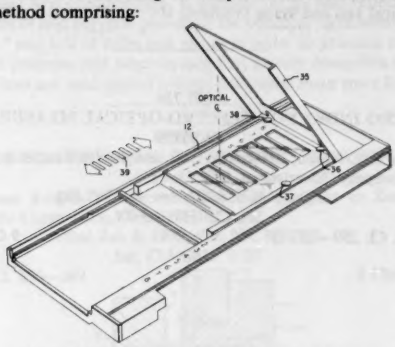
Filed May 24, 1977, Ser. No. 799,943
Int. Cl.[2] G01D *18/00*; G01N *21/38*
U.S. Cl. 250—252 **12 Claims**

1. A method of testing an optical analyzer of the type which includes:

a source of analysis energy, and a sample stage movable linearly one with respect to the other to scan a sample across said source,

a detector producing an output representing the optical characteristics in a track in said sample, and

a recorder for recording the output of said detector, said method comprising:



scanning multiple tracks of a test sample which bear features that generate detector outputs indicating performance parameters of said analyzer, and

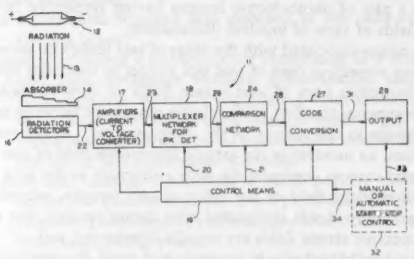
recording said outputs as a record of said performance.

4,097,736

RADIATION ENERGY CALIBRATING DEVICE AND METHOD

Arnold Frederick Jacobson, Madison, Wis., and James Oliver Pazaris, Chicago, Ill., assignors to Radnovation, Incorporated, Madison, Wis.

Filed Feb. 14, 1977, Ser. No. 767,987
Int. Cl.[2] G12B *13/00*; H05G *1/26*
U.S. Cl. 250—252 **12 Claims**



1. A radiation energy calibrating device for determining the peak voltage applied to a source of radiation where the source is subjected to a varying input voltage, said calibrating device comprising:

radiation detector means operated responsive to the radiation output of the source for providing electrical signals that are direct functions of the radiation intensity,

calibrated absorber means between said source and said detector means,

means for detecting the peak electrical signals provided by said radiation detector means;

means for converting the peak electrical signals to the kv peak input to the source, and

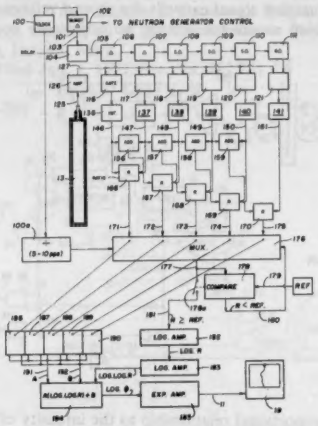
wherein said means for converting the peak electrical signals to the kv peak input to the source comprises means for determining the minimum absorber thickness through which the transmitted radiation spectrum is effectively monoenergetic and corresponds to the peak voltage applied.

4,097,737

EPITHERMAL DIE-AWAY POROSITY LOGGING

William R. Mills, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,933
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—269 **16 Claims**



1. An epithermal neutron detector which comprises:

(a) a thermal neutron counter, and

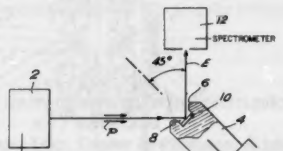
(b) a filter encasing said counter comprising a layer of cadmium about 8 mils thick and a layer of gadolinium about 10 mils thick to impart a substantially step function response immediately above the thermal neutron energy level.

4,097,738

METHOD OF ANALYSIS OF A SAMPLE OF INSULATING MATERIAL BY PHOTOELECTRONIC SPECTROMETRY

Lucette Feve, Gif-sur-Yvette, and Remy Fontaine, Montlhery, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 17, 1976, Ser. No. 751,374
Claims priority, application France, Dec. 19, 1975, 75 39096
Int. Cl.[2] H01J *39/00*
U.S. Cl. 250—305 **9 Claims**



1. A method of analysis of a sample of insulative material by photoelectronic spectrometry comprising the steps of:

fixing said sample of insulative material upon a conductive sample-holder;

subjecting a surface of said sample to photon radiation to effect the emission of photoelectrons therefrom, thereby developing positive charges at said surface in consequence of the vacancies resulting from said emission of photoelec-

trons which are not neutralized by the flow of charges within said sample;

simultaneously subjecting a portion of said conductive sample-holder to said photon radiation to effect the emission therefrom of electrons in the vicinity of said surface of the sample so as to neutralize said positive charges and thereby create a zone adjacent said surface exhibiting a substantially zero electric field; and

measuring the energy of photoelectrons emitted by said sample, said energy being compared with the energy of incident photon radiation to determine the electron binding energy of said sample.

4,097,739

BEAM DEFLECTION AND FOCUSING SYSTEM FOR A SCANNING CORPUSCULAR-BEAM MICROSCOPE

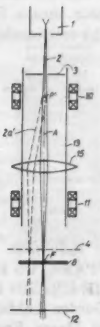
Karl-Heinz Müller; Moriz V. Rauch; Burkhard Krisch, all of Berlin, Germany, and Lee H. Veneklasen, San Leandro, Calif., assignors to Siemens Aktiengesellschaft, Berlin and Muncih, Germany

Filed Aug. 31, 1976, Ser. No. 719,111

Claims priority, application Germany, Sep. 12, 1975, 2541245

Int. Cl.² H01J *37/26*

U.S. Cl. 250—311 **3 Claims**



1. In a scanning, corpuscular-beam microscope including a beam deflection system comprising a first stage for deflecting the beam out of the optical axis of the microscope and a second stage, disposed after the first stage along the beam path, for deflecting the beam towards the optical axis of the microscope, and a first objective lens having a short focal length, disposed after the second beam deflection stage along the beam path, for focusing the beam on a specimen, the improvement comprising,

a second objective lens having a long focal length and disposed above said first objective lens along the beam path, said second objective lens being excited for low magnification of the specimen by the microscope and redirecting said deflected beam in a direction approximately parallel to said microscope axis and focusing said beam on said specimen, said first objective lens and said second stage of said deflection system being inoperative during said redirection of said beam by said second objective lens.

4,097,740

METHOD AND APPARATUS FOR FOCUSING THE OBJECTIVE LENS OF A SCANNING TRANSMISSION-TYPE CORPUSCULAR-BEAM MICROSCOPE

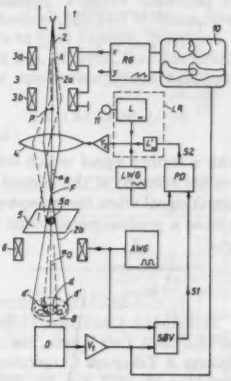
Karl-Heinz Müller; Reinhard Schliepe, and Volker Rindfleisch, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sep. 9, 1976, Ser. No. 721,693

Claims priority, application Germany, Sep. 19, 1975, 2542356

Int. Cl.² H01J *37/26*

U.S. Cl. 250—311 **9 Claims**



1. In a method for focusing the objective lens of a scanning transmission-type corpuscular-beam microscope in which the beam of the microscope is deflected by a deflection system excited in sawtooth fashion and generates a raster consisting of parallel lines on a specimen to be examined, said microscope including a beam radiation detector disposed behind the specimen along the beam path which generates an output signal which controls the brightness of a picture tube monitor operated synchronously with said raster, the improvement comprising the steps of,

measuring, during the exposure of a specimen point, partial beam radiation intensities in a cone of the beam at two points disposed symmetrical with respect to the longitudinal axis of said beam cone by means of said detector, the effective input area of said detector being smaller than the cross-sectional area of said cone at the same height in said microscope, and

adjusting the lens current of the objective lens of said microscope so that output signals generated by said detector are equal for both of said beam radiation measurements at said points thereby focusing said beam on said specimen.

4,097,741

X-RAY DIAGNOSTICS SYSTEM FOR X-RAY PHOTOGRAPHS

Manfred Pfeiler, and Kurt Dietz, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 20, 1976, Ser. No. 734,102

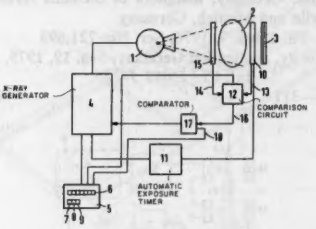
Claims priority, application Germany, Oct. 20, 1975, 2546948

Int. Cl.² H05G *1/02, 1/44*

U.S. Cl. 250—322 **6 Claims**

1. In an X-ray diagnostics system for making X-ray photographs including a control console having console selection means for selecting photographic values according to the organ to be examined, a radiation detector arranged to sense radiation exposure, and X-ray exposure control means connected with said radiation detector and operable for switching off the X-ray radiation when a predetermined radiation dose has impinged on said radiation detector, actual value signal

means connected with said radiation detector and operable for forming a transparency-actual value signal which corresponds to the X-ray transparency of a patient being examined, and comparator means connected with said actual value signal means and operable for comparing the transparency-actual



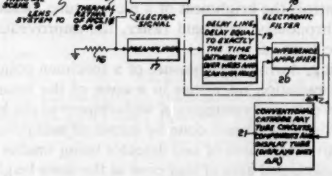
value signal with a further signal which corresponds to the photographic values selected at the control console and for supplying an output signal when the transparency-actual value signal deviates from a predetermined value range relative to said further signal.

4,097,742

THERMAL CAMERA TUBE

Edward Herbert Eberhardt, Fort Wayne, Ind., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.

Filed May 25, 1977, Ser. No. 800,593
Int. Cl.[2] H01J *31/49*
U.S. Cl. 250—333 **36 Claims**


THERMAL IMAGE 22
INFRARED WINDOW 11
VIDICON TUBE FOCUS AND DEFLECTION COILS 15
VIDICON TUBE ELECTRON GUN 16
READ OUT ELECTRON BEAM
VACUUM ENVELOPE 18
THERMAL SCENE
LENS SYSTEM 10
ELECTRIC SIGNAL
ELECTRONIC FILTER
DELAY LINE, DELAY EQUAL TO EXACTLY THE TIME BETWEEN SCAN LINES AND SCAN LINES
PREAMPLIFIER
DIFFERENCE AMPLIFIER
CONVENTIONAL CATHODE RAY TUBE CIRCUITS, EQUIPMENT AND DISPLAY TUBE (DISPLAYS SAME AS)

1. In a thermal camera tube, a thermal retina disposed in a vacuum envelope to receive thermal radiation emitted from an object comprising:

a bolometric thin film target;

a heat sink mesh disposed between said thermal radiation and said target to support said target, said heat sink mesh having webs to define web areas of said target and holes surrounded by said webs to define hole areas of said target; and

a contacting electrode disposed over said holes connecting said thin film target in said holes to said webs.

4,097,743

MOISTURE ANALYZING METHOD AND APPARATUS

Roger E. Carlson, Hopkinton, Mass., assignor to Moisture Systems Corp., Hopkinton, Mass.

Filed Apr. 19, 1977, Ser. No. 788,750
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—339 **40 Claims**

1. Analyzer apparatus comprising:

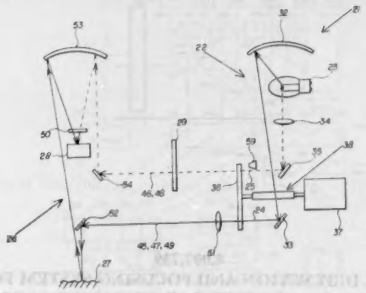
radiant energy source means;

first optical means for receiving radiant energy from said source means and producing first and second radiant energy beams having the same given band of wavelength;

second optical means for receiving radiant energy from said source means and producing third and fourth radiant energy beams having a common band of wavelength different than said given band;

photodetector means;

radiant energy director means for directing said first and third beams first to a sample being analyzed and then to said photodetector means and directing said second and fourth beams to said photodetector means; and



output means for comparing the energy levels of said beams as detected by said photodetector means.

2. Apparatus according to claim 1 wherein said photodetector means produces a signal V_m dependent upon the energy level of said first beam, a signal V_r dependent upon the energy level of said third beam, a signal $V_{m'}$ dependent upon the energy level of said second beam, and a signal V_r dependent upon the energy level of said fourth beam, and said output means comprises signal processor means for producing an output signal dependent upon the relationship

$$\frac{V_r}{V_m} \times \frac{V_{m'}}{V_r}.$$

4,097,744

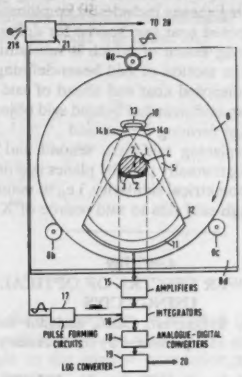
RADIOGRAPHIC APPARATUS HAVING REPETITIVE MOVEMENT OF THE ORIGIN OF THE RADIATION

Christopher Archibald Gordon LeMay, Osterley, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 630,779, Nov. 11, 1975, Pat. No. 4,010,370. This application Sep. 22, 1976, Ser. No. 725,507
Claims priority, application United Kingdom, Nov. 13, 1974, 49074/74
The portion of the term of this patent subsequent to Mar. 1, 1994, has been disclaimed.
Int. Cl.[2] G01N *21/34, 23/04;* G01T *1/20*
U.S. Cl. 250—366 **28 Claims**

1. An apparatus, for examining the body of a patient by means of penetrating radiation such as x-radiation, the apparatus including: a source of a substantially planar fan-shaped distribution of said radiation; support means arranged to support said source so as to irradiate a slice of said body with said radiation; detector means, including a plurality of detectors arranged to detect the radiation after passage through the body along a plurality of beams at different angles within said distribution; means for angularly moving the support means, and with it the source, about an axis intersecting the slice; and means for repetitively angularly displacing said beams relative

to said support means, such that, during each of a series of increments of the angular movement of said support means,

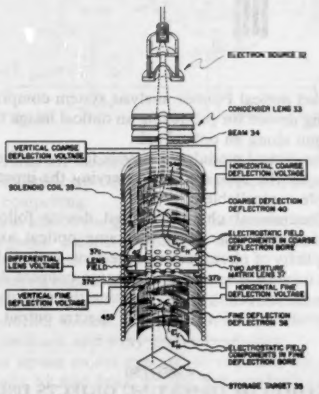


each of said beams remains at the same inclination in relation to said body.

4,097,745
HIGH RESOLUTION MATRIX LENS ELECTRON OPTICAL SYSTEM

Harold G. Parks, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 13, 1976, Ser. No. 732,019
Int. Cl.² G01K *1/08*
U.S. Cl. 250—398 **14 Claims**



1. An electron optical system for use in deflecting a beam of collimated electrons emitted by source means along an axis of said optical system toward a surface of target means spaced from said source means, comprising:

electron lens means positioned along said system axis between said source and target means and having an array of a plurality of lenslets each adapted for focussing a beam of electrons impinging thereon substantially to a point at a selected distance beyond said lens means toward said target means;

first means for forming a magnetic field of substantially constant amplitude essentially along said system axis at least between said lens and target means;

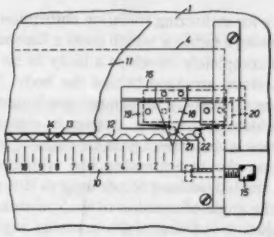
first deflection means for selectably deflecting said electron beam axially emitted from said source beam to illuminate a selected one of said plurality of said lenslets; and

second deflection means positioned between said lens and target means for relaying and deflecting the focussed beam of electrons to a selected impact site upon said target means surface responsive to the magnitude and polarity of a variable electric field and to said axial magnetic field contained within said second deflection means.

4,097,746
DRIVING AND POSITIONING ARRANGEMENT FOR RADIOGRAPHY

William Ellis Ingham, Peppard Common, Nr. Henley-on-Thames, and Anthony Michael Williams, Iver, both of England, assignors to EMI Limited, Middlesex, England

Filed Sep. 23, 1976, Ser. No. 726,051
Claims priority, application United Kingdom, Oct. 2, 1975, 40282/75
Int. Cl.² G03B *41/16*
U.S. Cl. 250—444 **3 Claims**



3. A radiographic system comprising:

a frame member having a housing with an aperture dimensioned to permit passage therethrough of at least part of a patient's body;

a carriage for supporting the patient's body in a generally horizontal position;

means for supporting the carriage and for moving the carriage, and with it the patient's body, relative to and through the aperture, generally along the longitudinal axis of the patient's body, to dispose a selected slice of the body at a selected position, relative to the aperture, for irradiation of said slice with penetrating radiation;

a scale member having a first part supported by said frame member and a second part supported by said carriage and moving therewith relative to said aperture, said parts of the scale member being juxtaposed and being dimensioned and marked to indicate, by their positions with respect to each other, the position of the carriage relative to the aperture;

means for selectively moving at least one of said scale member parts relative to the other, while the frame member and the carriage remain stationary, to cause said scale member parts to assume a selected juxtaposition relative to each other when said selected slice of the body is disposed at said selected position relative to the aperture of the frame member housing;

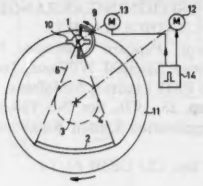
one of said scale member parts including a rack member with alternating ridges and notches extending along said longitudinal axis of the patient's body and the other one of said scale member parts including a first and a second microswitch each having a first and a second state;

means for placing each microswitch in its first or in its second state depending on whether a ridge or a notch of rack member is disposed at a selected position relative to the microswitch, the changes in state of said microswitches during relative movement of the two scale member parts being an indication of the extent and direction of such movement.

4,097,747
DEVICE FOR MEASURING ABSORPTION OF RADIATION IN A SLICE OF A BODY

Günter Kowalski, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 21, 1977, Ser. No. 761,452
Claims priority, application Germany, Feb. 3, 1976, 2604020
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—445 T 4 Claims

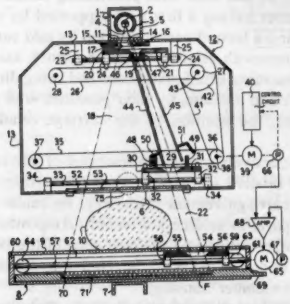


1. A device for measuring radiation absorption in a slice of a body, comprising a radiator which emits a fan-shaped radiation beam which completely envelops a body to be examined, an array of detectors, arranged behind the body, for measuring local radiation intensity, a movement mechanism for rotating the radiator/detector system during a measurement, and shielding means which moves with the radiator in a translatory manner during the measurement and whose orientation in space is not rotated, at least for as long as it is present in the beam path, the angle of rotation of the radiator/detector system being equal to the sum of the scanning angle (β) and the opening angle (α) of the fan-shaped radiation beam.

4,097,748
X-RAY APPARATUS ESPECIALLY FOR MAMMOGRAPHY

Jacques Monvoisin, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 5, 1977, Ser. No. 784,743
Claims priority, application France, Apr. 9, 1976, 76 10567
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—505 6 Claims



1. In an X-ray machine, especially for mammography which includes

a source of X-radiation, means for holding said source of X-radiation, for holding an object to be irradiated and for holding means for forming an image from said X-radiation, said source having a fixed diaphragm which defines a beam of X-radiation which has an angular deviation such that its shape resembles a pyramid of rectangular cross section, said X-ray machine further including beam-defining means for passing only a limited portion of said pyramidal beam, said beam-defining means being capable of motion in a plane perpendicular to the axis of said pyramidal beam, the improvement comprising:

said beam-defining means includes in combination:

a first slit disposed near said source for defining a narrow beam the long extent of which is substantially perpendicular to the motion of said beam-defining means;

a second slit disposed near and ahead of said object;

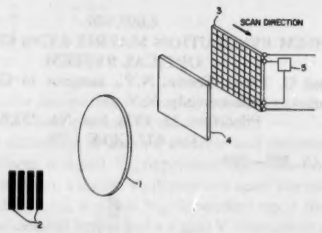
a third slit, disposed near and behind said object and ahead of said image forming means; and

means for displacing said first, second and third slit in unison along mutually parallel planes and in a manner to maintain geometrical similarity, i.e., to maintain a line of sight through said slits to said source of X-radiation.

4,097,749
FOURIER POWER SPECTRA OF OPTICAL IMAGES USING CCD'S

Keith L. Gardner, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 6, 1977, Ser. No. 757,429
Int. Cl.[2] G02B *27/38*
U.S. Cl. 250—550 5 Claims



1. A direct optical Fourier analysis system comprising:

a focusing device for producing an optical image of an optical input along an optical axis,

an electro-optical modulation device following the focusing device on the optical axis for varying the input signal at variable controllable intervals;

a two-dimensional charge coupled device following the modulating device along the same optical axis with a multiplicity of photo sensitive elements included therein a clock driver for scanning the charge coupled device as a means for detecting and processing the modulated signal and producing a Fourier power spectra output.

4,097,750
METHOD OF ORIENTING OBJECTS USING OPTICALLY SMEARED IMAGES

Robert W. Lewis, Rochester; Bernard W. Joseph, Berkley, and Frederick R. Faxvog, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 18, 1977, Ser. No. 779,158
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—548 7 Claims

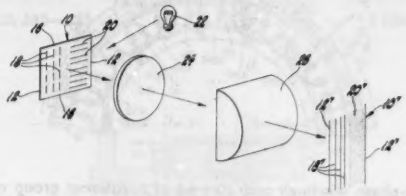
1. The method of determining the orientation of an industrial part wherein the part is characterized by a pattern of dominant parallel lines comprising the steps of

optically forming an image of the said part and smearing the image by at least one cylindrical lens having a cylinder axes to thereby smear the image as a function of the angle between the said parallel lines and the cylinder axis, the smeared image lines being sharpest when the direction of smearing is parallel to the said parallel lines and the smeared image lines are less sharp when the direction of smear differs from the direction of the parallel lines,

angularly scanning the part by rotating the image of the part relative to the cylindrical lens so that the smeared line

image sharpness varies according to the angle of image rotation,

photoelectrically detecting the smeared line image to acquire data on image sharpness, and



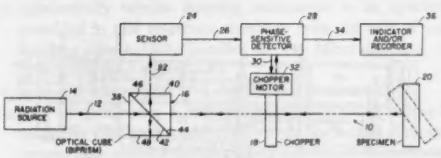
processing the acquired data to establish the angle of image rotation which results in the sharpest image and relating that angle to the angular orientation of said pattern of parallel lines.

4,097,751

RETROREFLECTANCE MEASURING APPARATUS

Walter G. Egan, Woodhaven; Herbert B. Hallock, Huntington, and Theodore W. Hilgeman, Deer Park, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Sep. 24, 1976, Ser. No. 726,262
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—571 **1 Claim**



1. Apparatus for measuring the electromagnetic reflectance and retroreflectance properties of the surface of a body or test specimen comprising:

a radiation source for generating a collimated beam of electromagnetic radiation which is directed such as to be incident on said specimen;

beam splitting means interposed in the path of said beam for transmitting components of said beam and reflecting other components thereof, including radiation reflected from said specimen, and stray ambient radiation;

radiation sensor means exposed to radiation reflected substantially by said beam splitter and producing an output signal in response to said reflected radiation;

radiation chopping means interposed in the path of said beam intermediate said beam splitter and said specimen for periodically blocking said radiation directed at said specimen whereby, when said chopper blocks reflectance from said specimen, the radiation reflected by said beam splitter into said sensor serves as a reference signal and, when the chopper passes radiation, the reflected radiation incident on said sensor serves as a measuring signal for determining reflectance from said specimen;

sequencing means for regulating the chopping rate of said chopper;

detector means for receiving said sensor output signal and having means for processing said sensor signal in coordination with said sequencing means, said detector having further means for comparing said reference signal component and said measuring signal component and producing a difference signal therefrom that characterizes the reflectance of said specimen; and

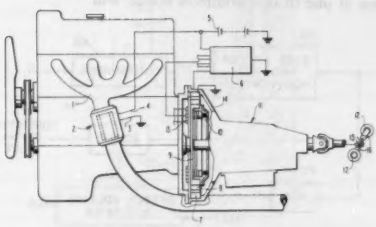
signal intelligence means receiving said difference signal and reducing said signal to a form suitable for utilization.

4,097,752

POWER SUPPLY OF INSTALLATIONS DRIVEN BY INTERNAL COMBUSTION ENGINES, ESPECIALLY OF MOTOR VEHICLES

Helmut Wulf, Ostfildern, and Wolfgang Weidemann, Fellbach, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Jul. 8, 1976, Ser. No. 703,603
Claims priority, application Germany, Jul. 12, 1975, 2531244
Int. Cl.[2] B60K *25/00*; F02G *5/02*
U.S. Cl. 290—20 **13 Claims**



1. A power supply arrangement for installations driven by internal combustion engines, which comprises a generator means, a storage battery means and load means as well as switching means and means for operatively connecting the generator means, storage battery means, load means and switching means, at least one thermionic converter means acted upon by the hot exhaust gases of the internal combustion engine serving as generator means, characterized in that also at least one electric motor means is provided as load means which mechanically feeds into the power flow of the drive connection of the installation, the thermionic converter means being constructed and rated for power output in accordance with the utilizable thermal energy content of the exhaust gases of the internal combustion engine, the electric motor means including a rotor and a stator, the rotor being operatively connected with a rotating part in the power flow connection for the mechanical drive of the installation, and the stator being arranged non-rotatably about the rotor and being radially immovably supported with respect to the rotor, and the electric motor means being arranged within the area of a flywheel of the internal combustion engine the rotor serving at least as a part of the flywheel mass.

4,097,753

COMPARATOR CIRCUIT FOR A C-2C A/D AND D/A CONVERTER

Peter William Cook, Mount Kisco; James Thomas Parrish, Carmel, and Stanley Everett Schuster, Granite Springs, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,178
Int. Cl.[2] H03K *5/20*
U.S. Cl. 307—359 **13 Claims**

1. A comparator circuit for comparing voltage levels in a digital-to-analog (D/A) converter, comprising:

a first field effect transistor (FET) having a gate and first and second electrodes, with its gate connected to the output of the D/A converter:

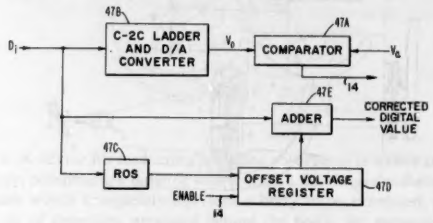
a second field effect transistor (FET) having a gate and first and second electrodes, with its gate connected to an analog input voltage, said first and second FETs each having their first electrode connected to a common voltage source;

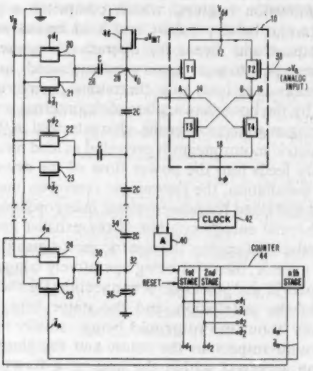
a third FET having a gate and first and second electrodes, with its first electrode connected with the second electrode of said first FET at a first common node;

a fourth FET having a gate and first and second electrodes, with its first electrode connected with the second elec-

trode of said second FET at a second common node, said second node being also connected to the gate of said third FET, said first node being also connected to the gate of said fourth FET, and said third and fourth FETs each having its second electrode connected to a common phase voltage source;

said digital-to-analog converter having an input and an output, with its output leading into the gate of said first FET and its input connected to respond to a means providing a digital representation of said analog input voltage which is connected to the output produced by said comparator at one of said common nodes; and





means for generating an offset voltage which is used to compensate for the differences in threshold voltages and current carrying capabilities of said four FETs said means for generating an offset voltage including means for adding said offset voltage to said digital representation of said analog input voltage being compared;

whereby said four FETs included in said comparator circuit compare said analog input voltage with said output of said D/A converter and produces an output at either of said common nodes.

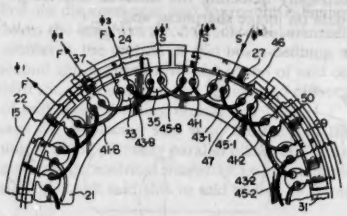
4,097,754

SHORT PITCH ALTERNATOR

James B. Farr, Ann Arbor, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Oct. 20, 1976, Ser. No. 734,117
Int. Cl.[2] H02K *21/12*
U.S. Cl. 310—67 R **10 Claims**

1. A three-phase alternating current generator having first and second relatively rotatable portions, an even number of *n* magnetic poles disposed on the first portion, the second portion comprising a slotted magnetic core having 3*n* slots respectively defining teeth therebetween, 3*n* coils, each coil being disposed about an adjacent pair of teeth and every third coil being connected in series to form a phase winding, there being



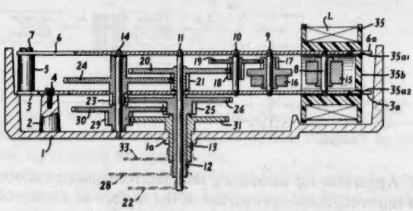
three-phase windings each formed of a different group of *n* coils.

4,097,755

CONSTRUCTION OF ELECTROMAGNETIC DRIVING DEVICE

Kiyoshi Kitai, Tokyo; Masuo Ogihara, Chiba; Kozo Sato, Yotsukaido, and Nobuo Shinozaki, Chiba, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed May 11, 1976, Ser. No. 685,408
Claims priority, application Japan, May 14, 1975, 50-57101; May 14, 1975, 50-63774[U]; May 14, 1975, 50-63778[U]
Int. Cl.[2] H02K *16/02*
U.S. Cl. 310—114 **6 Claims**



1. An electromechanical driving device comprising:

first and second permanent magnet rotors each having a plurality of magnetic poles;

at least one non-magnetic support plate having said rotors mounted thereon for rotation, said non-magnetic support plate including a projection projecting from an edge of said support plate in a direction of the length of said projection;

first mounting means for mounting said first rotor for rotation on said projection of said non-magnetic support plate, and second mounting means for mounting said second rotor for rotation on said non-magnetic support plate at a position proximate said first rotor for magnetically coupling with said first rotor and offset from the length direction of said projection so that a direction between said first and second rotors and the length direction of said projection are non-parallel;

a wheel train mounted on said support plate coupled with and driven by said second rotor; and

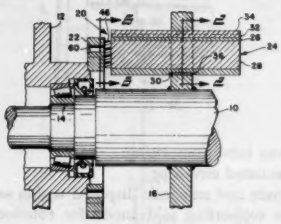
a coreless field coil energizable to develop an electromagnetic field and including a coil bobbin having an axial bore dimensional to receive said projection and positioned with said projection inserted into said axial bore to mount said coreless field coil on said projection of said support plate with said first rotor within said axial bore and positioned to drive said first rotor with the electromagnetic field to thereby drive said wheel train upon energization of said coreless field coil.

4,097,756

TUBULAR WHEEL SPEED SENSOR

Thomas A. Gee, Allen Park, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 460,325, Apr. 12, 1974, Pat. No. 4,029,108.
This application Jan. 28, 1976, Ser. No. 653,060
Int. Cl.[2] H02K *21/38*
U.S. Cl. 310—155 1 Claim



1. A device for sensing the rotational speed of a body relative to a reference structure on which said body is rotationally mounted, said device comprising:

a substantially tubular housing mountable in an aperture provided in said reference structure with the axis of said housing substantially parallel to but offset the axis of rotation of said body;

a source of magnetic flux received in said housing;

means for producing a split magnetic flux path, said split magnetic flux path producing means including first and second pole pieces received in said housing and positioned relative to said source of magnetic flux so as to be parallel to and equidistant from said source, rotation of said housing relative to said reference structure effective to vary the spacing of said pole pieces as measured on the circumference of a circle coaxial with the axis of rotation of said body;

coil means including a first winding wound about a portion of said first pole piece and a second winding wound about a portion of said second pole piece, said first and second windings between interconnected to produce an output signal at a set of terminals; and

means for mounting said tubular housing in said aperture in said reference structure, said mounting means permitting limited axial movement of said tubular housing relative to said structure, said mounting means comprising:

a key received in a first keyway formed in the outer periphery of said tubular housing, said key being positioned in said first keyway so as to be substantially parallel with the axis of said tubular housing, said key also being engageable with a second keyway provided in said reference structure, said second keyway being in communication with said aperture, varying the circumferential position of said second keyway relative to said aperture effective to vary the rotational position of said housing relative to said reference structure; and

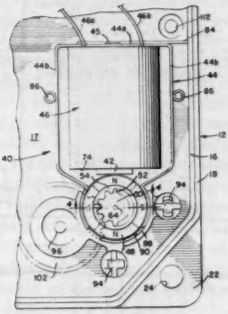
a radial spring positioned on the outer surface of said tubular member so that the inner surface of said radial spring is in contact with said outer surface of said tubular housing, said radial spring being substantially circular in cross section and having projections on the outer surfaces thereof, said projections being engageable with said aperture in said supporting structure.

4,097,757

SYNCHRONOUS MOTOR

Anthony W. Rigazio, Oglesby, Ill., assignor to General Time Corporation, Thomaston, Conn.

Filed Feb. 18, 1976, Ser. No. 659,108
Int. Cl.[2] H02K *21/00*
U.S. Cl. 310—162 15 Claims



1. A synchronous motor comprisng:

(a) a rotor of disc-shaped outline, said rotor having a plurality of permanently magnetized portions disposed in contiguous alternating fashion around an axis of rotation;

(b) a single-piece stator, said stator having a pair of legs defining at opposite ends a pair of stator poles, said poles being arcuate in outline, disposed substantially coaxially along said axis at an air gap, and spaced apart by an angle of between about 90° and 180°;

(c) a coil assembly including

(2) an elongated core having one end directed toward and located substantially at said air gap, said core end providing a core pole disposed substantially equidistantly from said stator poles, and

(2) a winding having a plurality of turns supported by said core, said winding adapted at opposite ends to be connected to means providing a source of current; and

(d) means mounting said rotor in said air gap and said stator to the other end of said core whereby said current source develops an energizing flux field across said air gap between said poles for driving said rotor.

4,097,758

COAXIAL DISK STACK ACYCLIC MACHINE

Kenneth W. Jenkins, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 2, 1976, Ser. No. 710,926
Int. Cl.[2] H02K *31/00*
U.S. Cl. 310—178 14 Claims

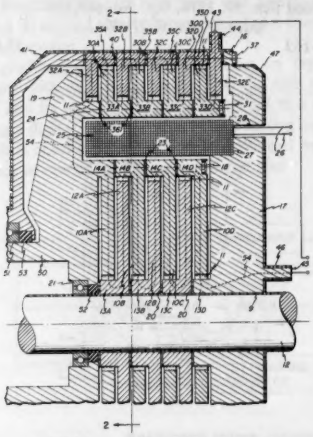
1. A radial type acyclic machine comprising:

a central, axial shaft;

a first plurality of low magnetic reluctance, electrically conductive disks centered about said shaft and positioned in a first axial stack rotatable about said shaft;

a second plurality of low magnetic reluctance, electrically conductive disks positioned in a second axial stack about said first axial stack and rotatable about said shaft;

conductive means electrically interconnecting each disk in each of said first and second pluralities of disks; and



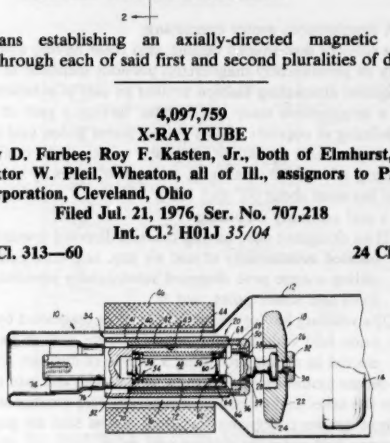
means establishing an axially-directed magnetic field through each of said first and second pluralities of disks.

4,097,759

X-RAY TUBE

Avery D. Furbee; Roy F. Kasten, Jr., both of Elmhurst, and Viktor W. Pleil, Wheaton, all of Ill., assignors to Picker Corporation, Cleveland, Ohio

Filed Jul. 21, 1976, Ser. No. 707,218
Int. Cl.[2] H01J 35/04
U.S. Cl. 313—60 **24 Claims**



1. An X-ray tube having an evacuated envelope within which are disposed a rotatable anode and a cathode, comprising:

(a) a support structure for rotatably supporting said anode, said support structure adapted to rapidly dissipate heat;

(b) a shaft upon which said anode is affixed extending outwardly of said support structure, said shaft adapted to control the rate of heat transfer from said anode to said support structure; and,

(c) a bearing included as part of said support structure, said bearing having portions lubricated by ion implantation of lead.

15. A rotatable anode structure for use in an X-ray tube, comprising:

(a) a cylindrical rotor body;

(b) a shaft extending outwardly from said rotor body along an axis substantially parallel to the axis of rotation of said rotor body;

(c) a disc-like anode affixed to said shaft;

(d) a housing disposed concentrically within said rotor body about which said rotor body rotates; and,

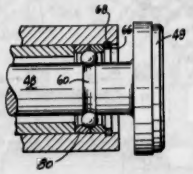
(e) a black coating applied to the outer surface of said rotor body, the inner surface of said rotor body, and the outer surface of said housing.

4,097,760

X-RAY TUBE HAVING BEARING LUBRICATION

Gabriel Cinelli, Niles, Ill., assignors to Picker Corporation, Cleveland, Ohio

Filed Jul. 21, 1976, Ser. No. 707,219
Int. Cl.[2] H01J 35/04
U.S. Cl. 313—60 **6 Claims**



1. An X-ray tube, comprising:

(a) an evacuated envelope;

(b) a cathode and an anode disposed within said envelope;

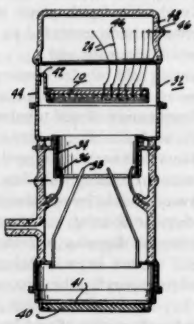
(c) means supporting said anode for rotation, said means including a bearing having portions lubricated by the ion implantation of a thin layer of metal.

4,097,761

IMAGE TUBE CATHODE

John E. Ruedy, and George A. Morton, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 16, 1966, Ser. No. 531,644
Int. Cl.[2] H01J 39/00
U.S. Cl. 313—94 **10 Claims**



1. A photocathode comprising a substrate having thereon, a photoemissive layer, an electrically resistive layer underlying the photoemissive layer, and terminal means electrically connected to spaced portions of said resistive layer, whereby a voltage differential may be applied between said spaced portions, the lateral resistivity of said resistive layer varying along the surface thereof.

4,097,762
XENON ARC DISCHARGE LAMP HAVING A PARTICULAR ELECTRODE COMPOSITION AND WHEREIN THE ARC DISCHARGE IS OBTAINED WITHOUT HEATING THE ELECTRODE

Joseph James Hilton, Bethlehem, and James Joseph Malloy, Jr., Easton, both of Pa., assignors to International Telephone & Telegraph Corporation, Nutley, N.J.

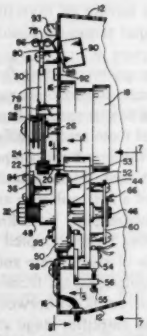
Continuation of Ser. No. 604,676, Aug. 14, 1975, abandoned.
This application May 17, 1977, Ser. No. 797,660
Int. Cl.[2] H01J *17/04, 61/06*
U.S. Cl. 313—218 **5 Claims**

1. In a xenon arc discharge lamp comprising an enclosed pressurized sealed optical envelope having a light transparent window, a pair of electrodes at opposite ends of said lamp, and means for applying a potential across said electrodes to provide an arc discharge therebetween, the improvement in which at least one of said electrodes comprises a porous sintered body of a refractory metal selected from the group consisting of tungsten and molybdenum, said body being impregnated with a fused mixture of alkaline earth oxides and a metal oxide, said arc discharge being obtained solely through field emission by application of said potential without heating said electrode.

4,097,763
ELECTRIC PROGRAMMER

Myrl J. Saarem, Carson City, Nev., assignor to Richdel, Inc., Carson City, Nev.

Filed Feb. 7, 1977, Ser. No. 765,882
Int. Cl.[2] H01H *7/00*
U.S. Cl. 307—141 **3 Claims**

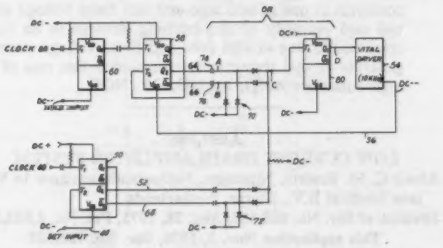


1. In an electric programmer, which includes: mounting means; clock motor means supported by said mounting means; a control disc rotatably mounted on said mounting means and connected to said clock motor means to be rotated thereby; gear actuating means attached to said control disc; a first shaft rotatably mounted on said mounting means; a gear coaxially mounted on said first shaft to be engaged by said gear actuating means during rotation of said control disc to turn said first shaft; a rotary distribution switch mounted on said mounting means and including a wiper contact connected to the first shaft to be rotated thereby, and further including a plurality of switch contacts to be selectively contacted as the wiper contact is rotated; switching means mounted on said mounting means and including an actuating arm; and switch actuating means for operating said switching means for manually controllable time intervals as said first shaft rotates and as said wiper contact engages successive ones of said switch contacts, said switch actuating means including: a selector disc coaxially mounted on said first shaft to be rotated thereby; a plurality of further shafts rotatably mounted in said selector disc and extending parallel to the first shaft; and a corresponding plurality of longitudinally-extending pins eccentrically mounted at the extremities of the respective further shafts in positions successively to engage said actuating arm as said first shaft rotates, the time interval of engagement of any one of said pins with said actuating arm being determined by the angular position of such pin with respect to the longitudinal axis of the corresponding further shaft.

4,097,764
FAIL-SAFE SOLID STATE LOGIC

Henry C. Sibley, Adams Basin, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Mar. 18, 1977, Ser. No. 779,192
Int. Cl.[2] H02H *7/20*
U.S. Cl. 307—200 A **6 Claims**



1. A fail-safe logic device, comprising

a solid state, toggle flip-flop AND gate having an output at which a binary one signal appears provided a first AC digital signal, representative of a binary one, applied to a first input occurs concurrently with another digital signal, also representative of a binary one, applied to a second input;

first means for applying such first AC digital signal to said first logic input of said device;

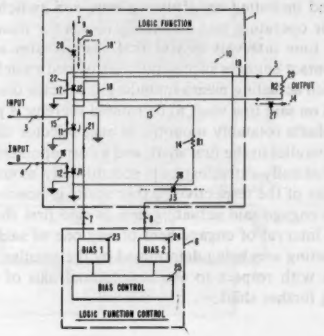
second means for applying said other digital signal at a DC voltage power supply terminal of said logic device as a second logic input of said device;

a vital driver coupled to said output of said toggle flip-flop AND gate, said vital driver being operative to accept only an output AC signal which is one-half the frequency of the AC digital signal at the first input, whereby any lack of conversion, due to a short or the like from input to output, will result in rejection of the unconverted, or wrong-frequency, signal then appearing at said output.

4,097,765
ELECTRONICALLY ALTERABLE NON-LATCHING JOSEPHSON AND, OR, NAND, NOR LOGIC CIRCUIT

Hans Helmut Zappe, Granite Springs, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1976, Ser. No. 701,374
Int. Cl.[2] H03K *19/195*
U.S. Cl. 307—212 8 Claims



1. A logic circuit comprising

a first non-latching device capable of carrying Josephson current having a zero voltage state and a finite voltage state shunted by a terminated transmission line,

a plurality of serially disposed non-latching devices capable of carrying Josephson current having a zero voltage state and a finite voltage state shunted by another terminated transmission line disposed in series with said first non-latching device, a portion of said another terminated transmission line being disposed in electrically coupled relationship with said first non-latching device,

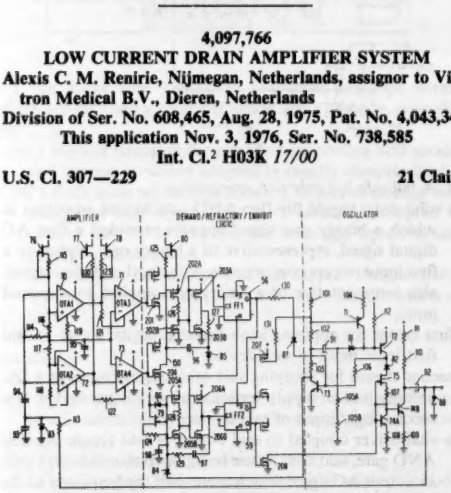
means connected to said plurality of devices for applying binary information signals thereto, and

means for biasing said first non-latching device in an initial condition in one of said zero and said finite voltage states and said plurality of non-latching devices in an initial condition in one of said zero and finite voltage states to generate at said terminated transmission line one of the logic functions AND, NAND, OR, NOR.

4,097,766
LOW CURRENT DRAIN AMPLIFIER SYSTEM

Alexis C. M. Renirie, Nijmegan, Netherlands, assignor to Vitatron Medical B.V., Dieren, Netherlands

Division of Ser. No. 608,465, Aug. 28, 1975, Pat. No. 4,043,347.
This application Nov. 3, 1976, Ser. No. 738,585
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—229 21 Claims



1. Low current drain apparatus for high gain signal amplification, comprising:

a. transconductance amplifier means for amplifying a received input signal, said amplifier means being characterized by having the circuit characteristic of a current source at its output, said current source being a function of the voltage level of said input signal;

b. an active circuit having an input and an output, said input being directly connected to the output of said transconductance amplifier means, said active circuit being characterized by having a high input impedance and being adapted to be driven at its output to a high or low state as a function of the signal at its input;

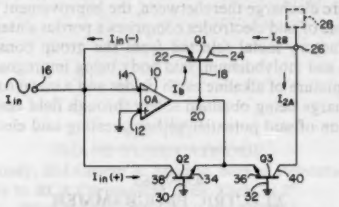
c. a current source circuit connected to said active circuit output; and

d. a high input impedance load connected to said current source circuit and to said active circuit output.

4,097,767
OPERATIONAL RECTIFIER

David E. Blackmer, Wilton, and C. Rene Jaeger, South Lyndeboro, both of N.H., assignors to DBX, Incorporated, Newton, Mass.

Filed Jan. 17, 1977, Ser. No. 759,734
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—229 13 Claims



1. A device for rectifying an AC current input signal applied at its input terminal and adapted to have its output terminal connected as a DC current source, said device comprising in combination:

an amplifier stage having an inverting input terminal connected to the input terminal of said device, and an output terminal;

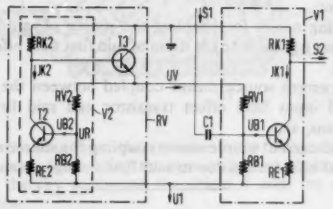
a first transmission path including first controllable current conveying means coupled between the input and output terminals of said device and connected to be controlled by the output signal from said amplifier stage so that current flows between the input and output terminals of the device along said first transmission path only when said input signal is of a first polarity; and

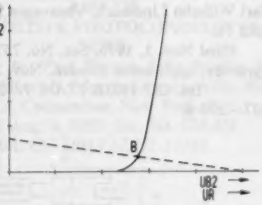
a second transmission path including second controllable current conveying means coupled between the input and output terminals of said device and connected to be controlled by the output signal from said amplifier stage so that a second current flows between said input and output terminals of said amplifier stage along said second transmission path and an inverted current substantially equal in magnitude but opposite in polarity to said second current simultaneously flows between the output terminal of said amplifier stage and the output terminal of said device along said second transmission path only when said input signal is of a polarity opposite said first polarity.

4,097,768
RECTIFIER

Franz Jenik, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 6, 1976, Ser. No. 747,955
Claims priority, application Germany, Dec. 5, 1975, 2554865
Int. Cl.[2] H02M 7/00
U.S. Cl. 307—230 8 Claims





1. A rectifier for rectifying an alternating voltage signal of small amplitude in which the alternating voltage signal is supplied directly to a first amplifier having a bent amplification characteristic formed by a linear portion, cut-off portion, and bent portion connecting the linear and cut-off portions, an operating point of said first amplifier being located at the bent portion of the characteristic and which delivers rectified signals at an output, a control amplifier being connected to the first amplifier which produces a control voltage for determining said operating point of the first amplifier, a supply voltage connected to said first and control amplifiers which is the same for both, said control amplifier having a second amplifier which is constructed in a same fundamental circuit arrangement as the first amplifier but which has an amplification which is large in comparison with the amplification of the first amplifier.

4,097,769
CIRCUIT FOR CONTROLLABLY PROVIDING POWER FROM AN AC SOURCE TO A LOAD

Michael A. Wilson, Sarasota; Fred J. Momparler, Bradenton, and Kenneth Coleman, Sarasota, all of Fla., assignors to Electro Corporation, Sarasota, Fla.

Filed Nov. 5, 1976, Ser. No. 739,261
Int. Cl.[2] H03K 17/56
U.S. Cl. 307—252 B 8 Claims

1. A circuit for controllably providing power from an AC source to a load upon the sensing of a conductive body comprising:

means for starting a pulse race between a first and a second pulse at the beginning of each half period of the AC source;

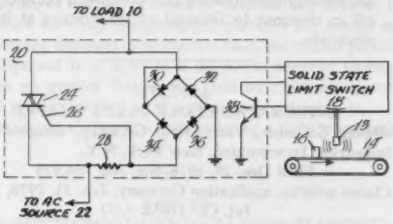
a first pulse path means coupled to said pulse race starting means for passing said first pulse in the event that a conductive body is not sensed within an established period of time and inhibiting said first pulse in the event that a conductive body is sensed within the established period of time;

a second pulse path means coupled to said pulse race starting means for passing the second pulse after a delay time, which delay time is longer than said established period of time;

terminal means coupled to said first and second pulse path means for receiving the first and second pulse;

means for connecting the AC source to a load upon reception of the second pulse prior in time to the reception of the first pulse, said connecting means coupled to said terminal means; and

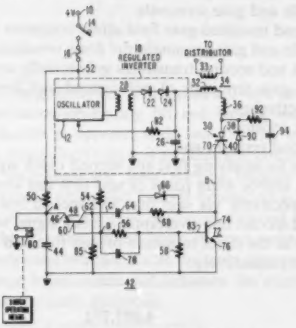
means for disconnecting the AC source from the load upon reception of the first pulse prior in time to the reception of the second pulse, said disconnecting means coupled to said terminal means.



4,097,770
SCR TRIGGER CIRCUIT

Michael Scott Fisher, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 11, 1976, Ser. No. 695,197
Int. Cl.[2] H03K 17/72
U.S. Cl. 307—252 J 15 Claims



1. A triggering circuit for a controlled rectifier having an anode, a cathode connected to a point of reference potential and having a gate electrode comprising, in combination:

a capacitor having a first plate connected to said reference potential and having a second plate;

a first switch for selectively connecting the second plate of said capacitor to said point of reference potential;

a first transistor having an emitter electrode connected to the second plate of said capacitor, having a collector electrode connected to the gate electrode of said controlled rectifier, and having a base electrode;

means for applying a bias potential to the base electrode of said first transistor for conditioning said first transistor to be nonconductive so long as the potential at said second plate does not depart from said reference potential by more than a predetermined value in the sense for tending to turn said first transistor on;

a charging circuit connected across said capacitor for charging said capacitor in said sense for tending to turn on said

transistor whenever said first switch does not connect the second plate of said capacitor to said point of reference potential, thereby to prevent the charging of said capacitor; and

means for automatically clamping the gate electrode of said controlled rectifier to a potential a given time after said first transistor turns on, each time said first transistor turns on, thereby conditioning said controlled rectifier to turn off in response to reversal of the voltage at its anode electrode.

4,097,771

INTEGRATED CLOCK PULSE SHAPER

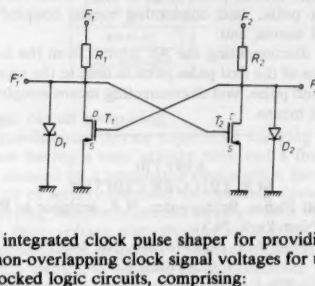
Wolfgang Gollinger, Voerstetten, Germany, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed Dec. 28, 1976, Ser. No. 754,925

Claims priority, application Germany, Jan. 31, 1976, 2603704

Int. Cl.[2] H03K *5/01*

U.S. Cl. 307—268 **2 Claims**



1. An integrated clock pulse shaper for providing first and second non-overlapping clock signal voltages for use in multiphase clocked logic circuits, comprising:

a first insulated-gate field effect transistor having source, drain and gate terminals;

a second insulated-gate field effect transistor having source, drain and gate terminals, the drain terminal of each of said first and second transistors galvanically cross coupled to the gate terminals of said second and first transistor respectively;

a first resistor;

a second resistor; and

means for applying first and second clock signal voltages to the source drain paths of said first and second transistors respectively via said first and second resistors, said first and second non-overlapping clock signal voltages appearing at the drain terminals of said first and second transistors respectively.

4,097,772

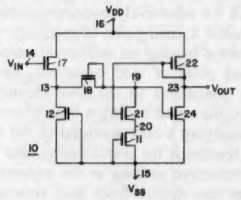
MOS SWITCH WITH HYSTERESIS

Ernest Aubert Carter, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 6, 1977, Ser. No. 803,500

Int. Cl.[2] H03K *3/295, 3/353, 17/04*

U.S. Cl. 307—279 **5 Claims**



1. A field effect transistor hysteresis circuit comprising:

an input and an output;

first and second field effect transistors, the sources of said first and second field effect transistors being coupled, respectively, to a first voltage means, the gate of said first field effect transistor being coupled to the drain of said second field effect transistor, and the gate of said second field effect transistor being coupled to the drain of said first field effect transistor;

first load means coupled between a second voltage means and the drain of said second field effect transistor;

an input field effect transistor having its gate coupled to said input;

coupling means for coupling the source of said input field effect transistor to the drain of said first field effect transistor;

first current source means coupled between the source of said input field effect transistor and said first voltage means; and

second current source means coupling the source of said first field effect transistor to said first voltage means.

4,097,773

SWITCHED MODE POWER SUPPLY

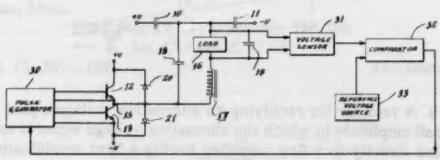
Magnus Carl Wilhelm Lindmark, Vasavagen 9, Stocksund, Sweden (S-182 74)

Filed Nov. 1, 1976, Ser. No. 737,511

Claims priority, application Sweden, Nov. 3, 1975, 7512267

Int. Cl.[2] H03K *17/04, 1/12*

U.S. Cl. 307—296 A **6 Claims**



1. In a switched mode power supply having a pair of supply voltage terminals, a pair of transistors having their emitter-collector paths connected in series to said terminals, first and second capacitors connected in series between said terminals, a series circuit of a load circuit and an inductor connected between the junction of said first and second capacitors and the junction of said emitter-collector paths, and a source of control pulses connected to the basis of said transistors; the improvement wherein said source of control pulses is connected to render said transistors conductive on alternate pulses, and further comprising a third capacitor connected in parallel with said load circuit and forming a series resonant circuit in combination with said inductor at a frequency substantially equal to the pulse repetition frequency of said control pulses of said source of pulses, whereby back e.m.f. of said inductor at the time of switching off of each of said transistors reduces the emitter-collector voltage of the other transistor at the switch on time of said other transistor.

4,097,774

ARC DISCHARGE FLASH LAMP AND SHIELDED COLD CATHODE THEREFOR

Robert J. Cosco, Amesbury; John M. Lo, Boston, and Roger T. Hebert, Peabody, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Jun. 3, 1976, Ser. No. 692,285

Int. Cl.[2] H01J *61/04*

U.S. Cl. 313—178 **5 Claims**

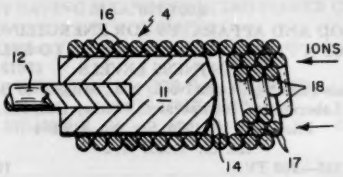
1. A cold cathode flash tube including an elongate envelope enclosing at least one cathode assembly and an electron discharge and ion counterflow path respectively from and toward the assembly, wherein the cathode assembly comprises:

a lead wire extending into the envelope,

a discrete body containing a sintered compound of electron

emissive material, the body being intermittently emissive when cold and being disposed on the lead wire;

a mass of refractory metal material interposed in the ion counterflow path toward the body so as to shield a substantial emissive area of the body from ion bombardment; and



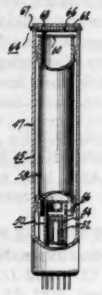
means extending from the emissive body to the refractory metal mass for holding the mass in spaced relation to the body thereby to expose the shielded area for electron emission.

4,097,775

INFRARED SENSITIVE PHOTOCONDUCTIVE PICKUP TUBE

George W. Bain, Jr., Fort Wayne, Ind.; Stanley V. Forgue, Princeton, and Albert G. Morris, Lawrenceville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1955, Ser. No. 526,458
Int. Cl.[2] H01J *31/00, 31/26*
U.S. Cl. 313—388 3 Claims



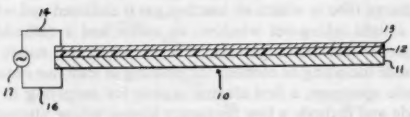
1. A photoconductive target for a pickup tube comprising a layer of porous lead telluride on a transparent conductive layer, said porous lead telluride having a resistivity of approximately 10^{-11} ohm cm when maintained at a temperature substantially equal to liquid nitrogen temperature.

4,097,776

COATED ELECTROLUMINESCENT PHOSPHORS

Sidney Allinikov, Yellow Springs, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 25, 1977, Ser. No. 781,228
Int. Cl.[2] H01J *1/62;* G02F *1/13;* C09K *3/34;* B05D *5/06*
U.S. Cl. 313—502 10 Claims



1. A composition consisting essentially of an electroluminescent solid particulate phosphor coated with a crystallized liquid crystal or a mixture of crystallized liquid crystals, said liquid crystal or mixture of liquid crystals melting at about the temperature to which the phosphor is heated as a result of being disposed in an electric field.

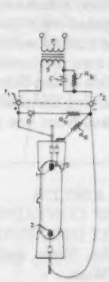
6. An electroluminescent device comprising a layer of electroluminescent phosphor particles coated with a crystallized liquid crystal or a mixture of crystallized liquid crystals, said liquid crystal or mixture of liquid crystals melting at about the temperature to which the phosphor particles are heated as a result of being disposed in an electric field, the coated particles being dispersed in a layer of a dielectric material having a thickness no greater than 3 mils; and an electrode member adhered to each surface of the phosphor-containing layer, at least one of the electrode members being a light transmitting layer.

4,097,777

ARC DISCHARGE LAMP INCLUDING STARTING CIRCUIT

Walter Bacharowski, Parma, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,255
Int. Cl.[2] H01J *7/44, 13/46, 19/78;* H01K *1/62*
U.S. Cl. 315—60 5 Claims



1. An arc discharge lamp comprising: an arc tube containing an ionizable radiation-generating fill and having main electrodes sealed therein at opposite ends and a starter electrode adjacent to one main electrode; and an electrical circuit within said lamp for increasing the peak starting voltage applied across the electrodes when said lamp is connected across the secondary side of a capacitor type ballast, said circuit comprising a diode and two resistors, the diode and one resistor being connected in series and bridged across the main electrodes, and the other resistor being connected between the starter electrode and th remote main electrode.

4,097,778

HEADLAMP AUTOMATIC DELAY SYSTEM

George Ludwig, Troy, Mich., assignor to Tom McGuane Industries, Inc., Farmington Hills, Mich.

Filed Oct. 12, 1976, Ser. No. 731,298
Int. Cl.[2] B60Q *1/02*
U.S. Cl. 315—82 33 Claims

1. In a headlamp delay device, the combination comprising

a switch having spaced contacts,

a switch contact member movable to successively engage said contacts at different positions,

a plurality of detent means for holding said contact member in each of said positions with a predetermined force,

a housing,

piston means dividing said housing into two chambers,

a passage associated with one of said chambers for connection to a source of vacuum,

an inlet to said one chamber,

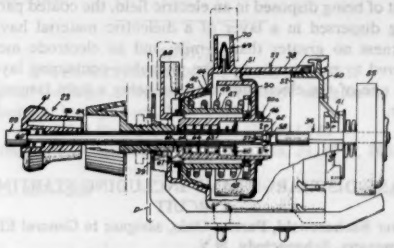
an orifice associated with said inlet to said chamber for

connection to a source of pressure higher than that supplied through said vacuum,

spring means yieldingly urging said piston means in a direction opposite to that which the vacuum tends to move said piston means,

a shaft extending through said housing through said piston means and connected to said switch contact member,

energy storing means interposed between the shaft and the piston means and operable by the piston means upon



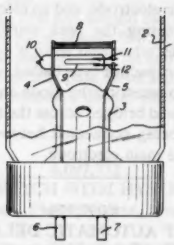
dissipation of the vacuum and functioning of said spring means to move said piston means to store energy when the vacuum is being dissipated such that upon predetermined storage of energy, the energy storing means functions to move the shaft and in turn the contact member within the switch against the action of the detent means successively storing energy and moving the shaft against the action of successive detent means from one detent position to another.

4,097,779

FLUORESCENT LAMP CONTAINING A CATHODE HEATER CIRCUIT DISCONNECT DEVICE

Frank M. Latassa, Magnolia, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Apr. 5, 1976, Ser. No. 673,822
Int. Cl.² H05B *41/18*
U.S. Cl. 315—106 **1 Claim**



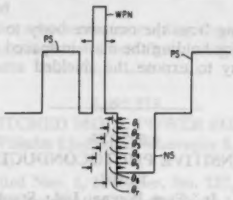
1. In a rapid start type of fluorescent lamp comprising an elongated glass envelope having a phosphor coating on the inner wall thereof and having an electrode at each end thereof and means to supply heater current to said electrode, the improvement which comprises a thermally actuable circuit opening device proximate said electrode, said device being normally closed at room temperature and thereby permitting heater current to flow through said electrode during lamp start up, said device becoming open after lamp ignition as a result of heat from said electrode, thereby stopping said heater current flow, said device comprising a U shaped bimetallic element enclosed in a sealed glass bottle and supported therein by two wires extending through the glass bottle seal, said electrode being mounted on a glass stem mount having two lead-in wires extending therethrough, one of said lead-in wires being connected to one end of said electrode and the other of said lead-in wires being connected to one of the wires that extends through the glass bottle seal, the other end of said electrode being connected to the other of the wires that extends through the glass bottle seal.

4,097,780

METHOD AND APPARATUS FOR ENERGIZING THE CELLS OF A PLASMA DISPLAY PANEL TO SELECTED BRIGHTNESS LEVELS

Peter Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 17, 1976, Ser. No. 715,161
Int. Cl.² H05B *41/24*
U.S. Cl. 315—169 TV **19 Claims**



11. A method for energizing a gas discharge display cell to a desired brightness level comprising the steps of

repetitively impressing alternating-polarity sustain signals across said cell, and establishing said cell in a temporary light-emitting state, by impressing at least a first write pulse of non-variable duration across said cell, said write pulse terminating prior to the initiation of a predetermined one of said sustain signals by a selected interval,

characterized by the step of selecting said interval as a function of said desired brightness level.

4,097,781

ATOMIC SPECTRUM LIGHT SOURCE DEVICE

Hideaki Koizumi; Yoji Arai, both of Katsuta, and Seiichi Murayama, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 25, 1975, Ser. No. 635,080
Claims priority, application Japan, Nov. 27, 1974, 49-135506
Int. Cl.² G01J *3/12*
U.S. Cl. 315—176 **15 Claims**

FIG. 1B

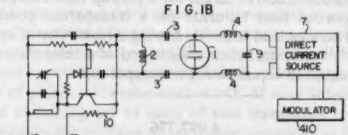
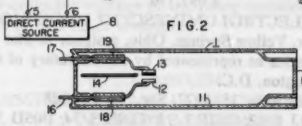


FIG. 2



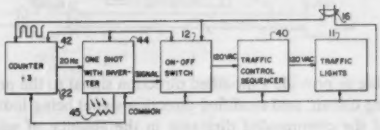
1. An atomic spectrum light source device comprising a discharge tube in which an inactive gas is enclosed and which has a light taking-out window, an anode and a cathode arranged in said discharge tube, at least one of said anode and cathode including an element for emitting at least one required atomic spectrum, a first electric source for supplying to said anode and cathode a low frequency power whose alternating period is longer than a flight time of ions between said anode and cathode to generate atoms of said element by sputtering due to a glow discharge from said at least one of said anode and

cathode, and a second electric source for supplying a high frequency power to said anode and cathode to excite said sputtered atoms.

4,097,782
ENERGY SAVING MEANS REDUCING POWER USED BY LAMPS

Hiram Darden Chambliss, 1900 N. 5th St., Grand Junction, Colo. 81501

Filed Dec. 15, 1975, Ser. No. 640,980
Int. Cl.[2] H05B *39/09*
U.S. Cl. 315—209 R **12 Claims**

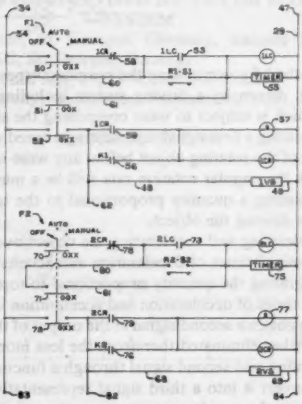


1. Energy saving means for reducing power used by lamps employing means reducing power without significant reduction of apparent brightness as viewed by the normal human eye, comprising in combination, a traffic signal incandescent lamp, a switching circuit for selectively providing upon command lamp lighting power at a predetermined lighting voltage for said lamp, and a command circuit actuating said switching circuit periodically including equipment providing a normal daytime mode of operation for lighting said lamp while in use in daytime brightness at a duty cycle of less than 100% and at a frequency between 5 Hz and 30 Hz to retain some of the brightness of one lighting pulse by the human eye until the next lighting pulse occurs, thereby constituting equipment with an operating mode whereby said power is decreased for lighting the lamp without a corresponding reduction in viewed brightness wherein said power for said lamp is supplied from an alternating current power source having a frequency N of 60 Hertz, and wherein said command circuit respectively turns on and off said lamp over a duration of on and off pulses having an integral number of successive half cycles.

4,097,783
ULTRAVIOLET LIGHT PROCESSOR

Michael L. Hathaway, Aurora, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 13, 1976, Ser. No. 722,470
Int. Cl.[2] H05B *41/36*
U.S. Cl. 315—323 **15 Claims**



13. An ultraviolet light processor comprising:

a. a sequence of medium or high pressure mercury vapor lamps for emitting ultraviolet light when connected to a source of alternating electrical power;

b. means for automatically and sequentially connecting lamps of said sequence through a reactance to a source of electrical power to thereby cause said lamps to emit ultraviolet light, wherein said reactance comprises an inductive reactance and a capacitive reactance;

c. timing means including only a single timing relay, said timing means cooperating with said connecting means for interposing a time interval in the range of from about ½ second to about 10 seconds between connections of adjacent lamps of said sequence to said source of alternating electrical power;

d. means for initiating the operation of said connecting means and said timing means;

e. means for permitting said connecting means to function only from the beginning of the connecting sequence;

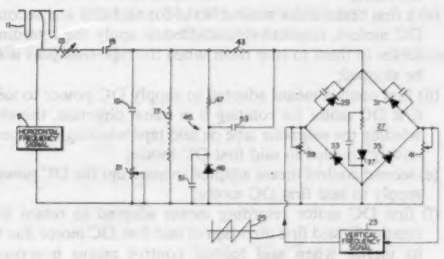
f. means for varying the capacitive reactance through a plurality of discrete steps of capacitive reactance; and

g. means for causing alternating electric power to be applied to said lamps through a predetermined value of reactance at least until said lamps are warmed up.

4,097,784
QUADRUPOLE CONVERGENCE CIRCUIT

Martin Fischman, Seneca Falls, and Jesse H. L'Hommedieu, Waterloo, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 31, 1977, Ser. No. 802,058
Int. Cl.[2] H01J *29/70, 29/76*
U.S. Cl. 315—368 **7 Claims**



1. In a cathode ray tube deflection apparatus employing an inline color cathode ray tube and an affixed deflection yoke having horizontal, vertical and quadrupole windings coupled to horizontal and vertical frequency signal sources, a quadrupole convergence circuit comprising:

a quadrupole winding;

means for developing substantially parabolic shaped horizontal and vertical frequency signals coupled to said convergence winding;

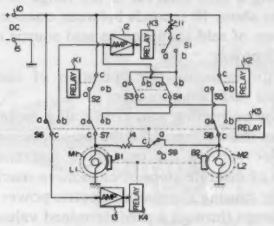
means for clamping said substantially parabolic-shaped horizontal and vertical frequency signals coupled to said quadrupole winding, said clamping means having an increasing impedance value in response to an increasing value of said substantially parabolic-shaped vertical frequency signal; and

means coupled to said clamping means and to said means for developing substantially parabolic-shaped vertical frequency signals, said means and said means for developing substantially parabolic-shaped vertical frequency signals combining to provide a compensating alteration in impedance value substantially proportional and opposite to the alteration in impedance value of said clamping means in response to an increasing value of said substantially parabolic-shaped vertical frequency signal whereby the magnitude of said substantially parabolic-shaped horizontal frequency signal is controlled.

4,097,785
MAGNETIC-TAPE-TRANSPORT APPARATUS

Mituhiro Sato, Yokohama, and Tomomi Kato, Tokyo, both of Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1976, Ser. No. 740,059
Claims priority, application Japan, Nov. 13, 1975, 50-154369[U]
Int. Cl.² B65H 77/00
U.S. Cl. 318—89 6 Claims



1. In a tape-transport apparatus of the type for winding a magnetic tape unwound from one reel on the other reel and vice versa, an improvement for stopping the apparatus comprising:

(a) a first DC motor having permanent magnet poles and operatively coupled to a tape-winding reel for rotating the same;

(b) a second DC motor having permanent magnet poles and operatively coupled to a tape-unwinding reel for rotating the same;

(c) a first brake and a second brake for said first and second DC motors, respectively, adapted to apply the retarding forces to them to stop them when the tape transport is to be stopped;

(d) first control means adapted to supply DC power to said first DC motor for rotating it in a first direction, thereby winding the magnetic tape on said tape-winding reel operatively coupled to said first DC motor;

(e) second control means adapted to interrupt the DC power supply to said first DC motor;

(f) first DC motor retarding means adapted to retard the rotation in said first direction of said first DC motor due to its inertia when said second control means interrupts power to said first DC motor, including second DC motor retarding means adapted to retard the rotation in said first direction of said second DC motor during a time period in which the magnitude of electromotive force generated by the rotation of said first DC motor due to its inertia after the DC power supply thereto has been interrupted is higher than a predetermined level; and

(g) means adapted to operate said first and second brakes when the magnitude of electromotive force reaches said predetermined level so as to stop the transport of the tape.

4,097,786
LIMIT CONTROL APPARATUS

Bryant D. Lund, Salt Lake City, Utah, assignor to E-Systems, Inc., Dallas, Tex.

Filed Jun. 16, 1976, Ser. No. 696,601
Int. Cl.² F16K 31/02
U.S. Cl. 318—282 5 Claims

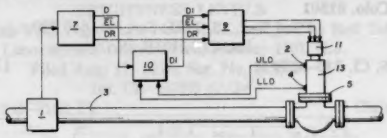
1. For use in a control system wherein a processing circuit is operable to receive a commanded direction signal and selectively effect movement of an actuator in accordance therewith subject to a first limit ot travel in a first direction, the combination comprising:

first limit sensing means connected to the actuator and operable to generate a first limit detection signal characterized by at least one electrical pulse, when the actuator approaches the first limit of travel;

integrating means arranged to receive said first limit detection signal and provide a first integral signal output;

comparator means arranged to receive said first integral signal output and provide a first limit signal when said first integral signal output exceeds a predetermined level; and

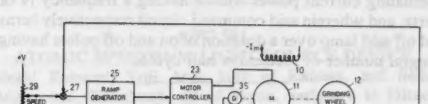
logic means arranged to receive said first limit signal and the commanded direction signal, said logic circuit being operable to provide a modified direction signal to the processing circuit, said modified direction signal being indicative of the commanded direction in the absence of said first limit signal, said logic means being operable to modify said commanded direction signal upon receipt of said first limit signal such that said modified direction signal is indicative of the direction opposite said commanded direction during the continuance of said first limit signal.



4,097,787
DEVICE FOR CONTROLLING THE PERIPHERAL SPEED IN ROTATING OBJECTS

Lars-Göran Larsson, and Frede Sörensen, both of Vesteras, Sweden, assignors to Asea AB, Vasteras, Sweden

Filed Jun. 9, 1976, Ser. No. 694,439
Claims priority, application Sweden, Jun. 17, 1975, 7506926
Int. Cl.² H02P 5/00
U.S. Cl. 318—332 14 Claims



1. A method for controlling the peripheral speed of a rotating object, driven by a driving system including an electric motor, which is subject to wear comprising the steps of:

(a) generating a first signal representing a speed reference for a size of the rotating object before any wear occurs and at which the angular rotation rate will be a minimum;

(b) measuring a quantity proportional to the torque of the motor driving the object;

(c) decelerating and accelerating the object over equal predetermined times of deceleration and acceleration;

(d) integrating the quantity proportional to torque over the equal times of deceleration and acceleration in an integrator to obtain a second signal at the output of the integrator which has eliminated therefrom the loss moment;

(e) coupling said second signal through a function generator to convert it into a third signal representative of the increase in the speed necessary to compensate for wear; and

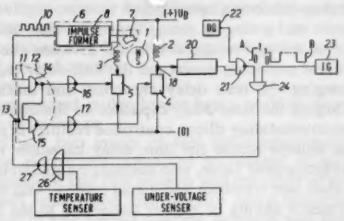
(f) using the sum of said first signal and third signal as a control input to the motor driving the rotating object.

4,097,788

CONTROL CIRCUIT FOR A SELF-STARTING ELECTRIC MOTOR

Nils Hansson Nygaard, Sonderborg; Kaj Nielsen, and Benny Strandtoft, both of Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Dec. 15, 1976, Ser. No. 750,728
Claims priority, application Germany, Dec. 17, 1975, 2556726
Int. Cl.[2] H02P 1/00
U.S. Cl. 318—415 2 Claims



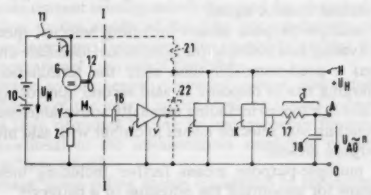
1. A control circuit for a self-starting electric motor having at least one stator winding in series with a pulse controllable electronic switch, gate control means having A and B inputs and an output connected to said switch with a first signal for said A input causing blocking regardless of the signal on said B input and with the opposite signal for said A input providing a signal for said output and direct transmission between said input B and said output, a starting impulse generator having a duty cycle with a short starting signal and a long stopping signal, a pulse generator connected to said B input and being responsive to the position of the rotor of said motor for producing a pulse wave corresponding to the speed thereof, a frequency-to-voltage converter connected to said winding for generating a signal corresponding to the speed of said motor, a comparator and a reference voltage for said converter to generate a digital signal at a predetermined voltage level of said converter, selector gate means having inputs connected to said starting impulse generator and said comparator and the output thereof connected to said o input A, said selector gate means allowing said comparator signal to override said starting impulse generator when said motor has normal speed and allow said short starting signal thereof to be transmitted to said input A when said motor is stopped or operating below its normal operating speed.

4,097,789

ROTATION-SUPERVISED D-C FAN OR BLOWER SYSTEM

Benno Doemen, St. Georgen, Germany, assignor to Papst-Motoren KG, St. Georgen, Germany

Filed Apr. 19, 1976, Ser. No. 678,361
Claims priority, application Switzerland, Apr. 26, 1975, 5351/75
Int. Cl.[2] H02H 7/08
U.S. Cl. 318—461 11 Claims



1. Rotation-supervised d-c fan, blower, or ventilator system having a brushless d-c motor (G) arranged for connection to a source of d-c (10) providing intermittent, pulsed power to said motor to operate said motor at a predetermined speed, or within a predetermined speed range, current flow (i) through the motor (G) being in pulses undulating between upper and lower values, whereby the current through the motor will have an a-c component, said system comprising

an impedance element (Z) connected in series with the motor (G);

an a-c responsive evaluation circuit (K, T) sensitive to the frequency of an applied signal, said evaluation circuit being connected across said impedance element and sensing the voltage drop of the a-c component of the pulsating current flow through the motor;

an a-c amplifier (V, V') connected across the impedance element (Z), and applying the a-c component of the voltage drop across the impedance element (Z) to the evaluation circuit (K, T);

and a band pass filter means (F) connected to the evaluation circuit (K, T) and to the motor and matched to the frequency of the a-c component at said operating speed, or range, to enhance said a-c component at said speed, or range, with respect to other frequencies at other speeds;

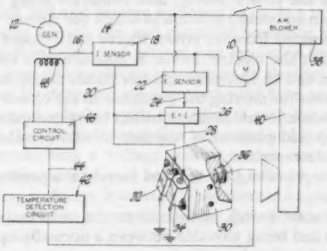
the evaluation circuit (K, T) providing an output signal (U_{AO}) if the frequency of the sensed a-c component of the pulsating current flow through the motor drops below a predetermined level.

4,097,790

MOTOR PROTECTOR WITH REMOTE TEMPERATURE SIMULATION

Robert J. Wilson, Bolingbrook, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 16, 1976, Ser. No. 714,389
Int. Cl.[2] G05B 5/00
U.S. Cl. 318—471 2 Claims



1. A motor protector located remotely from an electric motor that is subject to overheating comprising

means for generating an analog of motor temperature including a block of heat conductive material, first and second electrical heating elements mounted in heat transfer relationship with the block of heat conductive material for heating the block of material when current is applied to either of the elements, the block of material having a predetermined thermal inertia due to its mass and its specific heat which represents the thermal inertia of the motor, means in circuit with the motor for supplying current proportional to motor current to the first heating element, and means in circuit with the motor for supplying current proportional to motor power to the second heating element, the heating effect of said heating elements and the thermal inertia of said block being such that the block of heat conductive material is heated to an analog temperature corresponding to the actual motor temperature over a varying range of motor current and power,

a temperature detection element secured to the block of material in heat transfer relation therewith for responding to the temperature of said block, and

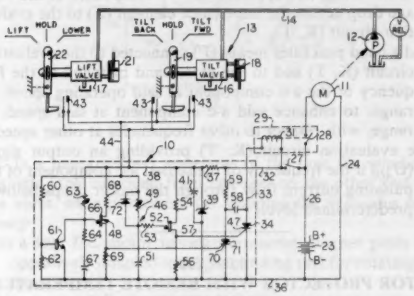
a circuit including the temperature detection element responsive to the temperature of said block for controlling the energization of the motor to prevent overtemperature operation.

4,097,791

DELAYED TURN-ON AND TURN-OFF CONTROL CIRCUIT

Ward L. Bivens, Painesville, and Richard A. Schwehr, Mentor, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Dec. 1, 1975, Ser. No. 636,785
Int. Cl.[2] H02P 1/04
U.S. Cl. 318—484 **4 Claims**



1. A delayed turn-on and turn-off control circuit for an electric motor comprising:

an electrical power source having a positive terminal and a ground terminal;

a motor relay having a normally open contactor connected in series between the electric motor and one of the terminals of the power source, said contactor being movable between an opened position at which the electric motor is disconnected from the power source and a closed position at which the electric motor is connected to the power source, and an electrical actuator means connected to the contactor for moving the contactor to the closed position in response to said actuator means being energized and to said opened position in response to said actuator means being de-energized;

means for providing an electrical current at a predetermined value;

a motor start switch connected to the current providing means and being movable between a normally open position and a closed position;

a power silicon controlled rectifier connected in series between the electrical actuator means and the ground terminal of the power source for energizing the electrical actuator means in response to receiving a first electrical signal and for de-energizing the electrical actuator means in response to receiving a second electrical signal, said power silicon control rectifier having a control gate for receiving the first electrical signal;

a turn-on delay means connected to the motor start switch and to the control gate of the power silicon controlled rectifier for delivering said first electrical signal to the control gate only after the running of a first predetermined period of time after the closing of the motor start switch;

a turn-off delay means connected to the motor start switch and to the power silicon controlled rectifier for delivering said second signal to the power silicon controlled rectifier only after the running of a second predetermined period of time after the opening of the motor start switch, said turn-off delay means including a commutating capacitor, means to charge the commutating capacitor to the voltage of the power source only when the power silicon controlled recitifer is conductive, a commutating silicon controlled rectifier connected between the commutating capacitor and the grounded side of the power silicon controlled rectifier, means for gating on the commutating silicon controlled rectifier after said second predetermined period of time following the opening of the switch for providing a reverse bias on the power silicon controlled rectifier as the second electrical signal for rendering it nonconductive, and means for disabling the turn-off delay means in response to the normally open start switch being closed and for initiating the running of the second predetermined period of time in response to the motor start switch being opened; and

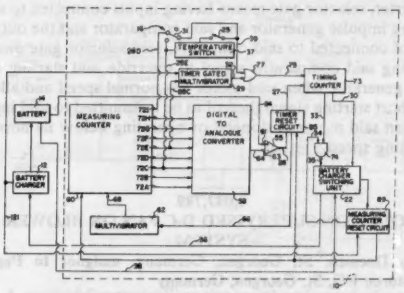
wherein said gating on means includes a time delay capacitor, a timing resistor connected between the electrical current providing means and the time delay capacitor for charging the time delay capacitor, and means for discharging the time delay capacitor to the control gate of the commutating silicon controlled rectifier in response to the voltage across the time delay capacitor reaching a predetermined value, said discharging means including a unijunction transistor and a load resistor, said unijunction transistor having its emitter connected to the time delay capacitor and one of its bases connected to the control gate of the commutating silicon controlled rectifier, said load resistor being connected to said one base of the unijunction transistor, a control gate of the commutating silicon controlled rectifier and to the ground terminal for keeping the control gate voltage low until the unijunction transistor is turned on.

4,097,792

BATTERY CHARGER CONTROL CIRCUIT

Ward Martin Calaway, Sierra Madre, Calif., assignor to Lester Electrical of Nebraska, Inc., Lincoln, Nebr.

Filed Dec. 9, 1976, Ser. No. 748,732
Int. Cl.[2] H02J 7/04
U.S. Cl. 320—22 **15 Claims**



1. Apparatus for controlling the charging of a battery, comprising:

multiple-purpose means for generating a first control signal when the rate of charging of the battery falls below a predetermined rate during a charging run and generating a second control signal;

said multiple-purpose means including selector means for activating said multiple-purpose means to initiate charging runs a predetermined time after the termination of a charging run in response to said second control signal;

said selector means including manually activatable means for including said selector means in circuit with said multiple-purpose means;

said multiple-purpose means further including measuring means for measuring the potential of a battery;

said measuring means including a first counter and means for applying pulses to said first counter;

said first counter having a plurality of output terminals;

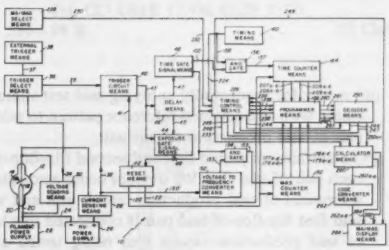
said multiple-purpose means further including a timer;
said timer including a second counter;
said multiple-purpose means further including switch means for applying a signal to said second counter from a selected one of said plurality of output terminals of said first counter when said multiple-purpose means is measuring the time since the termination of the previous cycle;
said second counter including means for generating said first control signal and said second control signal;
said multiple-purpose means including means for terminating a charging run in response to said first control signal;
said multiple-purpose means including a timer-gated multivibrator and an OR gate;
the output of said OR gate being electrically connected to said second counter;
a battery charger;
said timer-gated multivibrator being enabled by pulses on two of its inputs;
one of said two inputs of said timer-gated multivibrator being electrically connected to another of said output terminals of said first counter and the other of said inputs to said timer-gated multivibrator being electrically connected to said battery charger, whereby said timer-gated multivibrator is energized when said battery charger is applying charge to a battery and said first counter has counted to said other of said plurality of output terminals;
said manually activatable means including a first conductor connected to one input of said OR gate and second and third inputs and a manually activatable switch means for connecting said first conductor to either of said first and second inputs, said first input being electrically connected to another of said output terminals of said first counter and said third input being connected to still another of said outputs of said first counter.

4,097,793

X-RAY TESTING SYSTEM

Jonathan S. Shapiro, Greenwich; Vincent Berluti, Jr., West Haven, both of Conn.; Anthony Pellegrino, Brewster, N.Y., and Howard G. Wagner, Stamford, Conn., assignors to The Machlett Laboratories, Inc., Stamford, Conn.

Filed Oct. 22, 1976, Ser. No. 734,948
Int. Cl.[2] G01R *31/024*
U.S. Cl. 324—20 R **13 Claims**



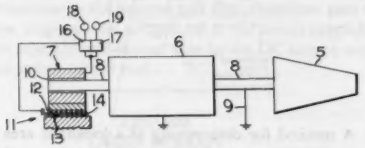
1. A system for testing an X-ray tube comprising:
anode current sensing means disposed for electrical connection to the anode of the tube for producing an analog voltage signal representative of anode current during an operational interval of the tube;
voltage to frequency converter means connected to the output of the anode current sensing means for producing a train of pulses having an instantaneous frequency proportional to the instantaneous amplitude of the analog voltage signal;
voltage pulse gating means connected to the output of the voltage to frequency converter means for permitting the passage of pulses in the train only during the operational interval;
trigger signal means connected to an input of the voltage gating means for rendering the gating means conductive at the commencement of the operational interval and including voltage gate signal means for producing a voltage gate signal during the entire operational interval and means for prolonging the voltage gate signal beyond the termination of the operational interval; and
voltage pulse counting means connected to the output of the gating means for counting pulses passed through the gating means during the operational interval and obtaining a quantity equivalent to the product of the anode current and the length of time transpired during the operational interval.

4,097,794

STATIC MEANS FOR DETECTING GROUND INSULATION FAILURE FOR ROTARY ELECTRIC MACHINES

Joe H. Burrus, Jr., Brookfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 15, 1976, Ser. No. 742,358
Int. Cl.[2] G01R *31/02, 31/12*
U.S. Cl. 324—54 **2 Claims**



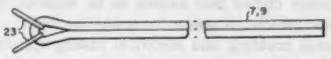
1. In combination with a dynamoelectric machine having an electrically grounded rotating shaft with electrical potential generated therein, a bearing rotatably supporting said shaft on a film of oil, said oil providing electrical insulation between said shaft and said bearing sufficient to cause a voltage potential across said oil film and electrical insulation isolating said bearing from electrical ground said insulation being dividing into at least two insulation portions by an electrical conductor, a device for detecting electrical potential from said bearing to said ground which avoids providing a path for current flow around the complete insulation to ground and is not subject to wear comprising a voltage sensing means connected across said conductor and said bearing, said voltage sensing means indicating a change in voltage when there is a condition exposing the unit to an increase in current flow from said bearing to said ground.

4,097,795

ELASTOMER BELT IMPREGNATED WITH CARBON FOR TESTING DIELECTRIC ADEQUACY AND FOR INDICATING PHYSICAL DEFECTS IN A NONCONDUCTING MATERIAL

Robert W. Thompson, Pearland, Tex., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 603,074, Aug. 8, 1975, Pat. No. 4,010,416.
This application Sep. 21, 1976, Ser. No. 725,315
Int. Cl.[2] G01R *31/12, 31/16*
U.S. Cl. 324—54 **2 Claims**



1. A belt to be utilized with a high voltage source for testing the Dielectric Adequacy and for detecting flaws in a non-conductive material, said belt comprising an elastomer strip rounded on opposite ends and impregnated with particulate conductive material, and a pair of D-shaped rings forming a buckle for tightening said belt and holding it in the tightened

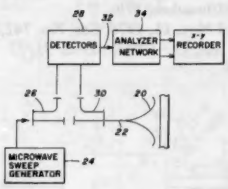
position, the D-shaped rings having rounded transitions to provide continuous curved smooth surfaces outside the belt, the belt being folded so that the rounded ends register and the buckle being disposed at the fold, the folded portion being bonded together in order to capture the buckle and form a smooth belt with no abrupt changes in cross-section, the belt and buckle cooperating to produce a smooth tight band around the non-conductive material and prevent corona discharge when connected to the high voltage source.

4,097,796

METHOD FOR TESTING RADOMES

Clarence D. Lunden, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 18, 1977, Ser. No. 769,852
Int. Cl.[2] G01R *27/04*
U.S. Cl. 324—58 B **11 Claims**



1. A method for determining at a localized area radio-frequency performance including delamination and/or water entrapment or other material or thickness changes to a radome designed to pass electomagnetic waves at a prescribed frequency, said method including the steps of:

illuminating by normal incidence a local radome patch with a sweep-frequency band of microwaves covering at least one-half octave centered, substantially, on said prescribed frequency,

coupling a reflectometer for response to the band of illuminating and reflected microwaves directed onto and from said local radome patch, respectively,

producing an X-Y plot corresponding to microwave reflectivity as a function of said microwave sweep-frequency, and

calibrating said X-Y plot with a signal coresponding to the reflectivity of a dielectric slab, block or a radome patch with known radio-frequency performance.

4,097,797

APPARATUS FOR TESTING ELECTRICAL CIRCUIT UNITS SUCH AS PRINTED CIRCUIT CARDS

Michel Finet, Soumagne, Belgium, assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 515,811, Oct. 17, 1974, abandoned. This application Jun. 7, 1976, Ser. No. 693,595
Int. Cl.[2] G01R *15/12*; G06F *11/00*
U.S. Cl. 324—73 R **11 Claims**

1. Modular electrical testing apparatus for circuit units having a plurality of connector terminals, comprising:

(A) connector means for engaging terminals of either a reference circuit unit known to be without faults or a production circuit unit to be tested for faults;

(B) means enabling said electrical testing apparatus to be operated in accordance with a Generating Mode and a Test Mode;

(C) reference pattern generating means effective during said Generation Mode for generating a digital coded reference pattern from said reference circuit unit, said reference pattern generation means comprising:

(i) application means for sequentially applying a series of preselected digital coded test stimuli to a selected terminal of a reference circuit card engaged in said connector means;

(ii) means for scanning all of said terminals engaged in said connector means for each said application of said test stimuli to each of said terminals of said reference circuit unit;

(iii) means for sensing a change in logic state of each of said scanned reference unit terminals and for identifying said terminals having a changed logic state as a result of said application of said test stimuli; and

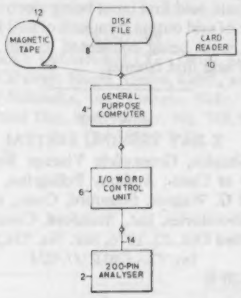
(iv) means for designating a part of reference code corresponding to said reference circuit unit

(D) means for recording said test stimuli applied to each of said reference circuit unit terminals, said identified terminals having changed logic states, said logic state of each of said identified terminals, and said part reference code of said reference circuit unit; and

(E) testing means effective during said Test Mode for testing said production circuit unit, said testing means comprising:

(i) means for inputting a desired part reference code of said production circuit unit;

(ii) means for selecting said recorded reference pattern corresponding to said desired part reference code;



(iii) means for sequentially applying said test stimuli associated with said selected reference pattern to said terminals of said production circuit unit;

(iv) a plurality of paired first and second flip-flop devices, each pair of said flip-flop devices being associated with a terminal of said production circuit unit and wherein said first flip-flop of said pair is connected to a terminal of said production circuit unit being tested and said second flip-flop of said pair is connected to said application means, and wherein said first flip-flop is effective to store an indication of a logic state change of its corresponding production unit terminal in response to said application of said test stimuli, and wherein said second flip-flop is effective to store an indication of an expected logic change of said terminal associated with said flip-flop pair as a result of said application of said recorded test stimuli, and wherein said plurality of paired flip-flop devices are disposed on one or more modular circuit cards for insertion into said electrical testing apparatus;

(v) means for comparing said stored logic states of said plurality of flip-flop pairs; and

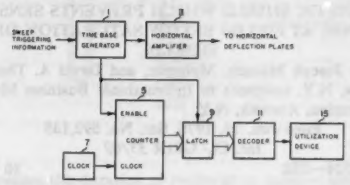
(vi) means for indicating a fault in said production circuit unit being tested when a mismatch between any of said compared flip-flop logic states is present.

4,097,798

OSCILLOSCOPE SWEEP RATE INDICATOR SYSTEM

David Harmon Olson, and Eldon Carl Berg, both of Aloha, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 28, 1977, Ser. No. 772,879
Int. Cl.[2] G01H 23/02
U.S. Cl. 324—78 D 3 Claims



1. A sweep rate indicator system for indicating the sweep rate of an oscilloscope, comprising:

a time-base generator circuit having a plurality of selectable fixed and variable sweep rates for providing a time-base ramp signal, said time-base generator circuit including means for generating a gate signal whose pulse width corresponds to the time period of said time-base ramp signal;

means for generating clock pulses having a predetermined repetition rate;

counter means responsive to said gate signal and said clock pulses for providing a count output proportional to the pulse width of said gate signal;

decoder means responsive to said count output for generating therefrom a control signal indicative of the sweep rate of said time-base ramp signal; and

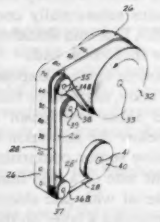
means responsive to said control signal for providing a digital readout of said sweep rate.

4,097,799

ELECTRICAL INDICATOR INCLUDING RELATIVELY TRANSLATABLE SCALE AND INDEX TAPES

Eric K. Thorson, Seattle, Wash., assignor to Eldec Corporation, Lynnwood, Wash.

Filed May 20, 1977, Ser. No. 798,817
Int. Cl.[2] G01R 17/06; G09F 9/00
U.S. Cl. 324—99 R 10 Claims



1. In an electrical indicator of the type including a housing having defined therein an elongated window having first and second ends; a DC torque motor supported within the housing and having a drum rotatable in response to an electrical signal; a first elongated tape having an index located thereon, the first tape having a first end attached to a peripheral surface of the drum; first and second rollers supported within the housing in proximity to the first and second ends of the elongated window, respectively; and a spring-biased, rotatable reel supported within the housing; the first tape passing from its first end in a first circumerential direction around a portion of the peripheral surface of the drum, over the first roller, and then over the second roller to terminate in a second end attached to a peripheral surface of the reel, the reel tending to cause the first tape to translate in a first direction past the window, and the DC torque motor rotating the drum in response to the electrical signal to tend to cause the first tape to translate in a second, opposite direction past the window, an improvement comprising:

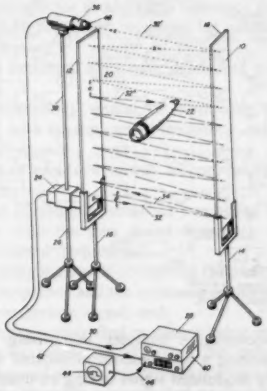
third and fourth rollers supported within the housing in proximity to the first and second ends of the window and adjacent to the first and second rollers, respectively; a second elongated tape having a plurality of spaced scale markings located thereon, a first end of said second tape being attached to the peripheral surface of the drum so that said second tape lies on the peripheral surface of the drum in spaced parallel relationship to the first tape, said second tape passing around a second portion of the peripheral surface of the drum in a second circumferential direction, opposite to the first circumferential direction, over said third roller, and then over said fourth roller to terminate in a second end attached to the peripheral surface of the drum at a location adjacent said first end of said second tape; and, means for tensioning said second tape as it passes around and over the drum and said third and fourth rollers, whereby said second tape translates in the first and second directions past the window as the first tape translates in the second and first directions past the window, respectively, in response to the forces exerted on the first tape and said second tape by the DC torque motor and the spring-biased reel.

4,097,800

LASER SCREEN

John Kuchmas, Jr., Kearny, and Gary E. Bubb, Hackettstown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 12, 1977, Ser. No. 758,627
Int. Cl.[2] G01P 3/66
U.S. Cl. 324—178 2 Claims



1. A laser screen apparatus for measuring the velocity of a projectile which comprises:

laser means for generating a monochromatic light beam which includes;

a laser having a light source emitting at a wavelength of 6328 angstroms;

a power supply electrically coupled to said laser for stimulating said laser to emit said monochromatic light beam;

detector means for sensing the presence of said monochromatic light beam of said laser means and generating an output signal in response to the interruption of said light beam which includes;

a photodiode operatively positioned and aligned to intercept said monochromatic light beam being reflected

from a reflecting means, said photodiode having an output electrically connected to a counter means; and

a narrow band pass optical filter positioned in front of said photodiode for filtering out all other wavelengths of visible light;

said counter means having an input electrically connected to said detector means for counting the time interval between launch of said projectile and to indicate the interruption of said monochromatic light beam by said projectile;

means for generating an initial triggering pulse for initiating said counter means when said projectile is launched, said counter means indicating the elapsed time, from launch to screen interception, that said projectile takes to travel a fixed distance from launch to said laser screen, said velocity being proportional to said elapsed time, and which may be determined by dividing said fixed distance by said elapsed time measured by said counter means; and

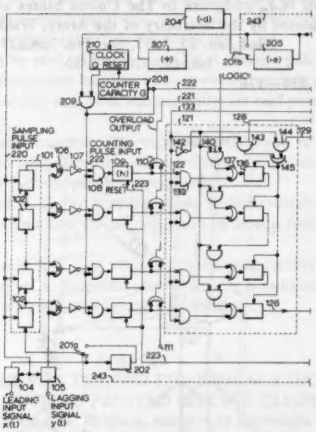
said reflecting means positioned intermediate said laser means and said detector means for successively reflecting said monochromatic light beam back and forth to form a vertically disposed light grid network.

4,097,801

CROSS-CORRELATOR CIRCUIT

David Lewis Freeman, Bridgenorth, and Ralph Seymour Flemons, Peterborough, both of Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Mar. 15, 1977, Ser. No. 777,769
Claims priority, application Canada, Apr. 1, 1976, 249394
Int. Cl.[2] G04F *8/00*
U.S. Cl. 324—188 **9 Claims**



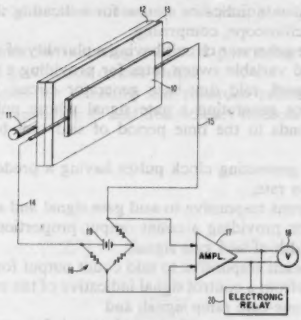
1. A cross-correlation analyser comprising: quantizing means for quantizing a first random modulated signal and a second similarly modulated signal having an unknown lapsed time interval from said first signal; variable oscillator delay means for delaying said quantized first signal by a succession of equal time delay increments to provide a series of delayed quantized versions of said first signal in time overlapped relation with said second quantized signal; a plurality of first comparison means each receiving a respective said delayed first quantized signal of said series and said second quantized signal, to simultaneously compare individual ones of said first series of delayed quantized signals with said second quantized signal; a plurality of counting means each connected to a respective said comparison means, the individual average counting rate of said counting means being a measure of the degree of coincidence between the respective first and second quantized signals; signal overflow detection means for determining which said counting means has the highest rate; signal responsive servo means connecting said overflow means in controlling relation with said variable oscillator to adjust said oscillator delay increments in order to locate said highest counting rate at a predetermined one of said counting means, and oscillator readout means to provide a function of said oscillator frequency as an inverse function of said lapsed time interval.

4,097,802

MAGNETORESISTIVE FIELD SENSOR WITH A MAGNETIC SHIELD WHICH PREVENTS SENSOR RESPONSE AT FIELDS BELOW SATURATION OF THE SHIELD

Nickolas Joseph Mazzeo, Mahopac, and David A. Thompson, Somers, N.Y, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1975, Ser. No. 592,135
Int. Cl.[2] G01R *33/02*
U.S. Cl. 324—252 **16 Claims**



15. Magnetic apparatus including a magnetoresistor sensor for sensing a magnetic field and said sensor having a first level of permeance,

a magnetic field source located in a predetermined position relative to said sensor,

a magnetically saturable shielding body of material having a substantially higher level of permeance juxtaposed with said sensor and being designed and located between said sensor and said source to absorb substantially all of smaller magnetic fields from said source for shielding said fields from reaching said sensor whereby the resistance of said sensor stripe remains substantially constant below magnetic saturation HSAT of said shielding stripe and varies significantly above that value, and

said magnetic field source being juxtaposed with said sensor and said shielding body, said source being adapted to vary the magnetic field about said sensor and said shielding body above and below the saturation level of said body, said magnetoresistive sensor comprising a thin film strip deposited upon one side of a thin film of a substantially non-magnetic material with said shielding body of magnetic material comprising a layer on the other side of said non-magnetic material.

4,097,803

BATTERY SELF-DISCHARGE INDICATOR

Keiva Feldman, Ottawa, Canada, assignor to Her Majesty the Queen as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Oct. 26, 1976, Ser. No. 735,820
Claims priority, application Canada, Apr. 30, 1976, 251571
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—29.5 **10 Claims**

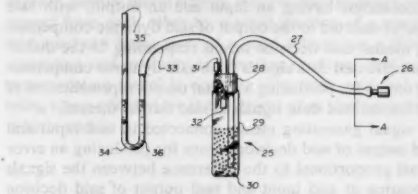
1. A method for detecting electrical leakage between electrodes in an electrochemical cell, comprising the steps of:

charging the cell to a fully charged condition;

storing the cell on open circuit for a predetermined period to

permit at least partial dissipation of the full charge due to said leakage;

recharging the cell to an onset of gassing condition;



measuring the duration of recharge to achieve said gassing condition; and

comparing said duration with a like parameter of a refernce cell to ascertain the presence of said leakage.

4,097,804

TRANSMITTING AND RECEIVING DIVERSITY SYSTEM

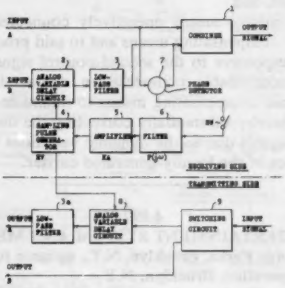
Masahisa Yamaguchi, Tokyo, and Tatsuo Watanabe, Mitaka, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Oct. 27, 1976, Ser. No. 736,133

Claims priority, application Japan, Oct. 30, 1975, 50-130840

Int. Cl.[2] H04B *1/06*

U.S. Cl. 325—15 **5 Claims**



3. In a diversity communication system which receives a plurality of analog signals having the same waveform, relatively shifted in phase, and which are received over different signal paths, and which transmits a plurality of analog signals having the same waveform over the same signal paths that the received analog signals are received; the combination comprising:

signal combining means for combining analog signals applied thereto;

means for applying one of the received analog signals to said signal combining means;

controllable variable delay means responsive to a control signal and receptive of the remaining received analog signals for delaying the remaining received analog signals by respective delay times determined by the control signal and for applying the respective delayed received analog signals to said signal combining means;

phase measuring means for measuring phase differences between the received analog signal applied directly to said combining means and the respective delay received analog signals and for applying a control signal to said controllable delay means for varying the respective delay times of the respective delayed received analog signals to reduce to negligible values the phase differences between the received analog signal applied directly to said signal combining means and the respective delayed received analog signals applied to said signal combining means;

switching means receptive of an analog signal to be transmitted for switching the same between the different signal paths over which the received analog signals are received;

second delay means receptive of one of the analog signals to be transmitted for delaying the same and for applying the delayed analog signal to be transmitted to the signal path over which the received analog signal applied directly to said signal combining means is received; and

means for applying the remaining analog signals to respective ones of the other signal paths.

4,097,805

FREQUENCY-SYNTHESIZER TYPE TRANSCEIVER

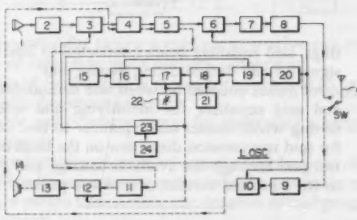
Motoyuki Fujii; Koji Yokota, and Hajime Yashita, all of Tokyo, Japan, assignors to Torio Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1976, Ser. No. 695,397

Claims priority, application Japan, Jun. 27, 1975, 50-80214

Int. Cl.[2] H04B *1/40*

U.S. Cl. 325—17 **2 Claims**



1. A phase-locked loop circuit for a frequency-synthesizer type transceiver comprising:

(a) an oscillator for producing a reference frequency,

(b) a voltage controlled oscillator for producing an output frequency,

(c) a first oscillator circuit for producing a designated frequency,

(d) first combining means for combining the output frequency with the designated frequency and forming a first mixed frequency,

(e) a second oscillator circuit for producing a carrier frequency,

(f) second combining means for combining the carrier frequency with the first mixed frequency and forming a second mixed frequency,

(g) comparing means for comparing the phases of the second mixed frequency and the reference frequency and producing a comparison signal, and

(h) the voltage-controlled oscillator being connected to the comparing means for receiving the comparison signal, whereby said signal regulates the output frequency produced by the voltage-controlled oscillator.

4,097,806

ADAPTIVE EQUALIZER WITH IMPROVED DISTORTION ANALYSIS

John Brian Evans, Plano, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1976, Ser. No. 672,108

Int. Cl.[2] H04B *1/12*

U.S. Cl. 325—42 **21 Claims**

14. In a receiving terminal for an analog data communication system which relies on a limited bandwidth, switched transmission medium for supplying said receiving terminal with a modulated, passband input signal suffering from an unknown degree of transmission distortion;

said input signal including a series of test pulses during a predetermined equalizer adjustment period; and

said receiving terminal including means for demodulating said input signal, whereby a baseband version of said training pulses is recovered:

the improvement comprising

an adaptive equalizer having a plurality of available settings, said equalizer being connected to feed said input signal to said demodulating means; and

control means coupled between said demodulating means and said equalizer for identifying and selecting the setting which causes said equalizer to best compensate for said transmission distortion on the basis of only one test pass through the available settings and in response to the baseband version of said test pulses.

4,097,807

AUTOMATIC EQUALIZING METHOD AND SYSTEM

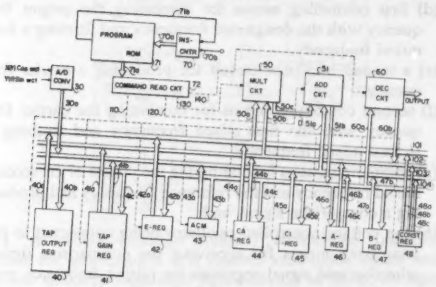
Noriaki Fujimura, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 29, 1975, Ser. No. 644,507

Claims priority, application Japan, Dec. 27, 1974, 50-1303

Int. Cl.[2] H04I *27/18*

U.S. Cl. 325—42 **19 Claims**



1. Apparatus for use at the receiving terminal of a suppressed carrier data communications system, receiving transmitted data signals over a transmission channel, for automatically compensating for static transmission channel characteristics, and for dynamic variations in the amplitude and phase characteristics of the locally-generated carrier frequency, comprising:

a transversal filter having an input for receiving distorted data signals from the transmission channel, said transversal filter having a controllable transfer function, and an output for data signals as modified by said transfer function;

dynamic compensating means operatively connected to said output of said filter for correcting distortion of the modified data signals caused by the dynamic variations in the amplitude and phase characteristics of the locally-generated carrier, said dynamic compensating means having controllable compensating characteristics and having an output for providing distortion corrected data signals;

decision means having an input and an output, with said input connected to the output of said dynamic compensating means, said decision means responding to the distortion corrected data signals from said dynamic compensating means for producing a digital output representation of the transmitted data signals at said output thereof;

error signal generating means connected to said input and said output of said decision means for producing an error signal proportional to the difference between the signals appearing at said input and said output of said decision means;

processing means connected to said decision means and to said error signal generating means, and responsive to said output of said decision means and to said error signal for processing the error signal to produce a first control signal representative of only the data signal distortion due to the static transmission channel characteristics, and a second control signal representative of only the data signal distortion due to the dynamic locally-generated carrier characteristics;

first control means operatively connected to said transversal filter, to said processing means, and to said error signal generating means, and responsive to the first control signal and to said error signal for varying said controllable transfer function of said filter to minimize the error signal, thereby substantially correcting the distortion of the data signals due to the static characteristics of the transmission channel, and

second control means operatively connected to said dynamic compensating means and to said processing means, and responsive to the second control signal for varying said controllable compensation characteristics of said dynamic compensating means to minimize the error signal, thereby substantially correcting the distortion of the data signals due to the dynamic variations in the characteristics of the locally-generated carrier.

4,097,808

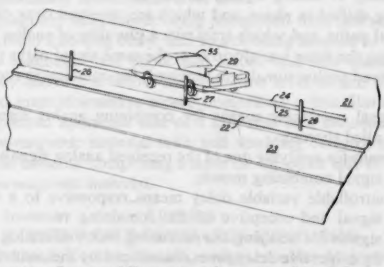
ENTERTAINMENT SYSTEM AND METHOD

Harry George Parke, Brooklyn, N.Y., assignor to Marine Electric Corporation, Brooklyn, N.Y.

Filed Apr. 2, 1976, Ser. No. 672,950

Int. Cl.[2] H04B *7/00*

U.S. Cl. 325—51 **1 Claim**



1. A system for providing entertainment and/or information to automobile vehicles having radio receivers and receiving aerials, travelling along a roadway, comprising, an antenna comprised of two parallel conductors strung adjacent to said roadway and parallel to the direction thereof, transmitter means for exciting said two conductors with a modulated radio frequency signal within 550 to 1650 Khz broadcast band so that each vertical slice through said antenna is effective as a dipole, said transmitter means being adjusted to excite said antenna weakly enough so that the radiated signal is negligible beyond

short distances from said roadway so as not to interfere with ordinary broadcast reception, but strongly enough so that said vehicles, which are substantially closer than a wavelength's distance from said antenna, and within the near field region thereof, receive useful signals, said conductors being vertically spaced from each other by a small fraction of a wavelength, said roadway being part of a road which has a divider for separating said roadway and another roadway, said roadways accomodating travel in opposite directions, and said antenna being along said divider at the height of an average automobile vehicle aerial.

4,097,809

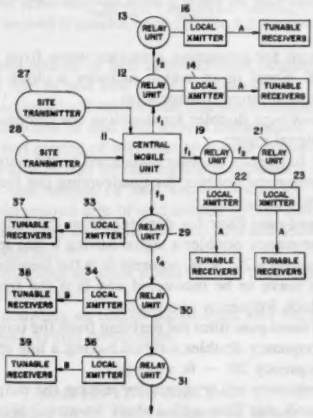
LOCAL EVENT BROADCAST SYSTEM

Albert J. Miller, Campbell, Calif., assignor to Engineering Systems Corporation, Santa Clara, Calif.

Filed Sep. 1, 1976, Ser. No. 719,680

Int. Cl.[2] H04B *3/60, 7/20*

U.S. Cl. 325—54 **10 Claims**



8. A method of providing program coverage only within the location of a main event, with various programs different from each other and relating to sub-events of the main event, comprising the steps of: assembling and radio broadcasting the plurality of programs at corresponding plural different frequencies from a central location; separately receiving each of the different frequency radio broadcasts from the central location at at least a corresponding number of different relay locations within the locality of the main event, so that at each relay location only one program of the plurality of programs broadcast from the central location is received; at each of the relay locations, radio broadcasting, respectively, the program received at the relay location at a low power only covering the area of the sub-event location; providing a plurality of mobile spectators within each sub-event location with portable radio receivers tunable to the low power radio broadcast from the relay location within the respective sub-event location so as to receive only the program relating to such sub-event.

4,097,810

PHASE LOCKED LOOP TUNING SYSTEM WITH A PRESET CHANNEL MEMORY

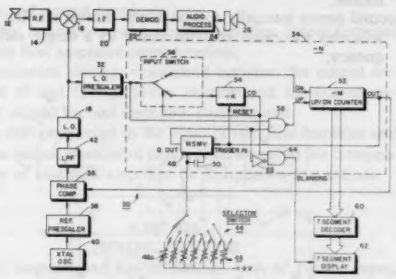
Felix Aschwanden, Thalwil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Apr. 26, 1977, Ser. No. 790,863

Claims priority, application United Kingdom, Oct. 27, 1976, 44661/76

Int. Cl.[2] H04B *1/16*

U.S. Cl. 325—453 **10 Claims**



1. An apparatus for tuning a receiver to receive any one of a plurality of radio frequency carriers, comprising:

a plurality of passive timing means corresponding to respective radio frequency carriers;

monostable multivibrator means for generating a programming signal;

program selection means for selectively coupling one of said plurality of passive timing means to said monostable multivibrator means to determine the duration of said programming signal;

local oscillator means for generating a local oscillator signal having a frequency determined in response to a control signal;

first counter means for counting to a fixed number K in response to a signal coupled to it;

second counter means for counting to a programmed number M of signal cycles determined in response to the duration of said programming signal in response to a signal coupled to it;

input switch means for selectively coupling said local oscillator signal to said first and second counter means in accordance with the number of cycles accumulated by said first and second counter means, one of said first and second counter means developing an output signal having a period directly related to the period of said local oscillator signal by a factor $N = K + M$, said input switch means enabling storage of said programmed number M in said second counter means development during said output signal; and

phase comparator means for generating an error signal representing the phase and frequency deviations between a reference frequency signal and said output signal and developing therefrom said control signal for said local oscillator means.

4,097,811

RADIO WITH AUTOMATIC SCAN TUNING

Lee Hullinger, Jr., Greentown, and Leo E. Noble, Russiaville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 2, 1977, Ser. No. 773,384

Int. Cl.[2] H04B *1/32*

U.S. Cl. 325—470 **3 Claims**

1. In a radio having power tuning means and means responsive to a received radio frequency signal for generating an on-station signal, apparatus comprising, in combination:

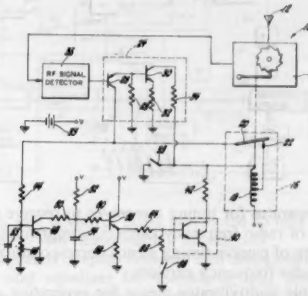
a latching switch having a sweep position and being effective in said sweep position to activate the power tuning

means to sweep through a range of frequencies within a frequency band and further having a stop position and being effective in said stop position to deactivate the power tuning means to remain tuned to a single radio frequency, the latching switch being characterized by a time delay in latching in the sweep position;

circuit means responsive to the on-station signal for switching the latching switch to its stop position,

first means for switching the latching switch to its sweep position to thereby initiate a sweep of the power tuning means;

second means manually activatable to disable the first means whereby the radio remains tuned to a single radio frequency;



third means responsive to the latching switch in its stop position to activate the first means, if not disabled, after a first predetermined time delay of sufficient length to permit recognition of a received radio signal and activation of the second means;

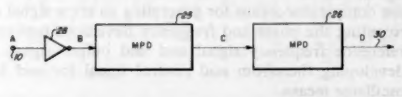
fourth means responsive to the latching switch in its sweep position to deactivate the first means after a second predetermined time delay of just sufficient length to ensure latching of the latching switch in its sweep position, whereby the power tuning means resumes sweeping through the range of frequencies after stopping at each received radio frequency signal, until the second means is activated.

4,097,812

FREQUENCY SELECTIVE DETECTOR CIRCUIT

Theodore S. Rzeszewski, Lombard, Ill., assignor to Matsushita Electric Corporation, Franklin Park, Ill.

Filed Jul. 25, 1977, Ser. No. 818,651
Int. Cl.² H03K 9/06
U.S. Cl. 328—138 **7 Claims**



1. A frequency selective detector system including in combination:

first means having an input and an output for measuring an interval between pulses applied to the input thereof and providing a first output state on the output thereof when the interval between such input pulses is less than a first predetermined amount and providing a second output state on the output thereof whenever the interval between such input pulses is more than said first predetermined amount;

second means having an input connected to the output of said first means for measuring an interval between input pulses applied thereto and responsive to the output state of said first means to provide a first output state on the output thereof whenever the interval between successive attainments of the second output state of said first means is less than a second predetermined amount and providing a second output state whenever the time interval between successive attainments of the second output state of said first means is more than said second predetermined amount; and

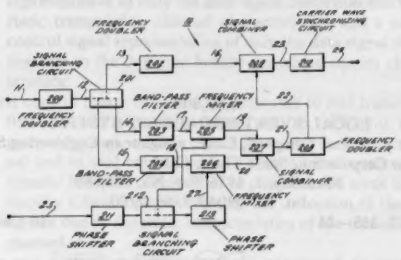
means for supplying input pulses to the input of said first means.

4,097,813

CARRIER WAVE RECOVERY CIRCUIT

Susumu Otani, and Toshitake Noguchi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1977, Ser. No. 803,900
Claims priority, application Japan, Jun. 8, 1976, 51-67329
Int. Cl.² H03K 9/00
U.S. Cl. 329—104 **2 Claims**



1. A circuit for extracting a carrier wave from a double-binary PSK signal input which includes a clock frequency component, said circuit comprising:

a first frequency doubler for doubling the frequency of said PSK signal input;

a second frequency doubler connected to the output of said first frequency doubler for quadrupling the frequency of said PSK signal input;

a first band-pass filter for deriving from the output of said first frequency doubler a signal having a line spectrum at the frequency 2fc + fs, wherein fc is the frequency of said carrier wave to be recovered and fs is the frequency of said clock frequency component;

a second band-pass filter for deriving from the output of said first frequency doubler a signal having a line spectrum at the frequency 2fc − fs;

a first frequency mixer means for mixing the output of said first band-pass filter with a clock frequency signal having the same frequency as and being in-phase with said clock frequency component, said first mixer means to mix said output of said first band-pass filter and said clock frequency signal in such a manner as to generate an output signal containing a line spectrum at the frequency 2fc;

a second frequency mixer means for mixing the output of said second band-pass filter with said clock frequency signal, said second mixer means to mix the output of said second band-pass filter and said clock frequency signal in such a manner as to generate an output signal containing a line spectrum at the frequency 2fc;

a first signal combiner circuit for combining the outputs of said first and second frequency mixer means;

a third frequency doubler connected to the output of said first signal combiner;

a second signal combiner for combining the outputs of said second and third frequency doublers;

a carrier wave synchronizing circuit for deriving a synchronized carrier wave from said output signal of said second signal combiner circuit.

4,097,814
PUSH-PULL POWER AMPLIFIER

Marvin Cohn, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 17, 1977, Ser. No. 807,715
Int. Cl.[2] H03F 3/26
U.S. Cl. 330—286 12 Claims

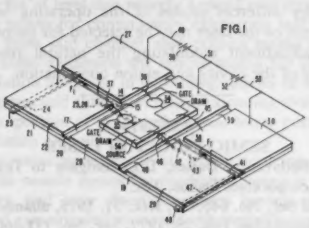


FIG. 1

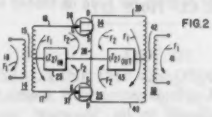


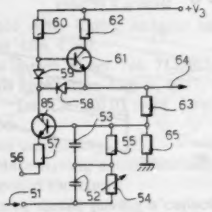
FIG. 2

1. A push-pull power amplifier comprising:
- a first and second tee shaped slot line hybrid component each having a first, second and third arm,
- said first and second arms of said first and second hybrid component arranged to conduct anti-phase waves on said respective arms derived from a wave on said third arm,
- a first and second transistor each having a gate, source, and drain,
- said gate and source of said first transistor coupled across said first arm of said first hybrid component,
- said gate and source of said second transistor coupled across said second arm of said first hybrid component,
- said drain and source of said first transistor coupled across said first arm of said second hybrid component,
- said drain and source of said second transistor coupled across said second arm of said second hybrid component,
- means for coupling said source of said first and second transistors together,
- means for coupling an input signal on said third arm of said first hybrid component, and
- means for coupling an output signal from said third arm of said second hybrid component.

4,097,815
AMPLIFYING CIRCUIT

Armando Campioni, Turin, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Rivalta (Turin), Italy

Filed Mar. 29, 1976, Ser. No. 671,645
Claims priority, application Italy, Apr. 9, 1975, 67907 A/75; May 19, 1975, 68285 A/75
Int. Cl.[2] H03F 1/32
U.S. Cl. 330—289 3 Claims

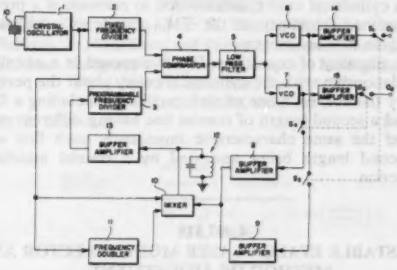


1. An electrical amplifier circuit for providing high voltages for driving a user load impedance, the impedance value of which varies with frequency, such as a video amplifier circuit for a television receiver, said amplifier circuit comprising:
- a first amplifier element (61) such as a transistor, having input and output terminals, and having an output impedance which is substantially lower than the minimum value of said load impedance within the frequency range of the signals fed to said amplifier circuit;
- means for connecting said first amplifier output to said user load impedance;
- a second amplifier element (85) such as a transistor, having input and output terminals;
- means for connecting said second amplifier output terminal to said first amplifier input terminal;
- a commutation element connected between the output terminal of said first amplifier element and the output element of said second amplifier element; and
- a diode (59) connected to the input of said first amplifier and to the output element of said second amplifier for compensation of said first amplifier for temperature variations.

4,097,816
TUNING SYSTEM

Kazuyoshi Imazeki, and Koichi Kazami, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Filed Jul. 20, 1977, Ser. No. 817,367
Int. Cl.[2] H03B 3/04
U.S. Cl. 331—2 6 Claims



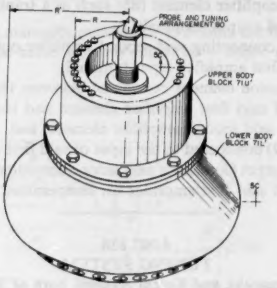
1. A system for generating a plurality of preselected frequencies in a radio frequency device, comprising: means for generating a first reference signal having a predetermined frequency; means, including at least two controllable variable-frequency oscillators, a mixer, a programmable frequency divider, and a switch, for generating a second reference signal, with said mixer being coupled to said first reference signal generating means and being selectively coupled to one of said variable-frequency oscillators by said switch to generate an output signal having a frequency corresponding to the difference between the frequency of said first reference signal and the frequency of said selected variable-frequency oscillator; means coupled to said first reference signal generating means and to said second reference signal generating means and including said programmable frequency divider for comparing said first and second reference signals and developing a control signal which varies systematically in accordance with the frequency difference between said first and second reference signals, with said control signal being applied to both said controllable variable-frequency oscillators to vary the oscillation frequencies thereof until the frequency of said second reference signal is substantially equal to the predetermined frequency of said first reference signal, whereby the output signal of the selected controllable variable-frequency oscillator has a frequency which corresponds to one of the plurality of predetermined receiver frequencies as selected by both the programmable frequency divider and the controllable variable-frequency oscillator selected by the switch.

4,097,817

CYLINDRICAL CAVITY POWER COMBINER FOR PLURALITY OF COAXIAL OSCILLATORS

Glenn R. Thoren, Norwood; James L. Lampen, Burlington, and George Jerinic, Acton, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 30, 1977, Ser. No. 814,745
Int. Cl.[2] H03B 7/14, 9/12
U.S. Cl. 331—56 **3 Claims**



1. An improved power combiner for radio frequency energy utilizing the combination of a cylindrical cavity with a plurality of coaxial oscillators coupled to such cavity around the periphery thereof, such combiner comprising:

(a) a cylindrical cavity dimensioned to resonate at a predetermined frequency in the TM_{01N} mode of oscillation, where N is an integer;

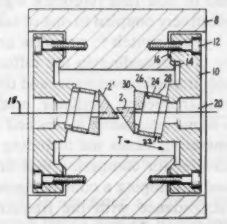
(b) a plurality of coaxial oscillators disposed in a coupling relationship with the cylindrical cavity about the periphery thereof, each one of such oscillators including a first and a second length of coaxial line having different radii and the same characteristic impedance, such first and second length being separated by a coaxial matching section.

4,097,818

ADJUSTABLE ETALON LASER MODE SELECTOR AND METHOD OF ADJUSTMENT

Nubar Sahag Manoukian, San Jose, and Thomas Frazier Johnston, Jr., Sunnyvale, both of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed Sep. 3, 1976, Ser. No. 720,198
Int. Cl.[2] H01S 3/082
U.S. Cl. 331—94.5 C **7 Claims**



1. An adjustable etalon mode selector mounted within the optical cavity of a laser, said etalon comprising

a pair of spaced prisms mounted along the optical axis of said cavity with the laser beam passing therethrough, each said prism having a first surface facing outwardly of said etalon and inclined at a slight angle to a normal to said optical axis, and each said prism having a second surface optically adjacent and spaced from the second surface of the other said prism, each said second surface being inclined at an angle relative to said cavity optical axis that is generally equal to Brewster's angle for the laser nominal wavelength, and

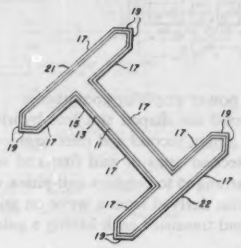
means for selectively adjusting the spacing between said prisms while maintaining the resonant frequency of the laser cavity and etalon combination remains substantially constant during said adjustment of said prism spacing, whereby different modes of the operating wavelength spectrum of the laser may be selected for output without such adjustment modulating the natural resonant frequency of the cavity and etalon combination.

4,097,819

SEMICONDUCTOR LASER

David W. Bellavance, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 645,773, Dec. 31, 1975, abandoned. This application Feb. 25, 1977, Ser. No. 771,866
Int. Cl.[2] H01S 3/19
U.S. Cl. 331—94.5 H **8 Claims**



1. A semiconductor I-bar mesa laser on a semiconductor substrate comprising:

an elongated central member having a longitudinal axis;

a cross-bar integral with each end of said central member and perpendicular to said longitudinal axis; and

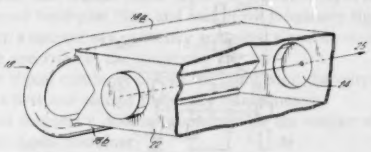
oppositely spaced facets at each end of said central member, said facets being parallel to one another and perpendicular to said substrate, whereby said facets form reflecting mirrors of a longitudinal lasing cavity of said central member.

4,097,820

LASERS

Roland John Hill, Quarndon; Robert Bryn Price, Burton-on-Trent, and Norman Thomas Jewell, Countesthorpe, all of England, assignors to Rolls-Royce Limited, London, England

Continuation of Ser. No. 576,542, May 12, 1975, which is a continuation-in-part of Ser. No. 325,832, Jan. 22, 1973, abandoned. This application Jan. 21, 1977, Ser. No. 761,206
Claims priority, application United Kingdom, Jan. 26, 1972, 3801/72
Int. Cl.[2] H01S 3/02
U.S. Cl. 331—94.5 G **4 Claims**



1. A detonation powered gas dynamic laser comprising:

a circuitous detonation channel having at least one substantially linear portion in the circuit thereof;

means for supplying an explosive mixture to said detonation channel;

means for igniting said mixture to excite at least one detonation wave into circulation around said circuit, the ignition of said mixture producing detonation gases containing a lasing species;

means for maintaining said circulation of said detonation wave for at least one passage around said circuit;

exhaust means for continuously exhausting said detonation gases from said channel, said exhaust means including a supersonic expansion slit nozzle means for producing a population inversion in said lasing species of said detonation gases, said slit nozzle means extending over a substantial proportion of the length of said linear portion of said detonation channel circuit; and

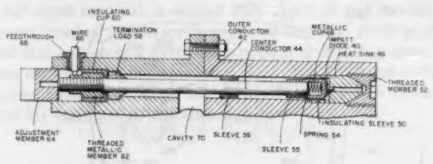
laser resonator means receiving said detonation gases from said slit nozzle means for producing lasing in said lasing species, said laser resonator means having at least one optical axis oriented to extend substantially parallel to the lateral extent of said slit nozzle means.

4,097,821

COAXIAL LINE IMPATT DIODE OSCILLATOR

James L. Lampen, Burlington; George Jerinic, Acton, and Glenn R. Thoren, Norwood, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 30, 1977, Ser. No. 814,741
Int. Cl.[2] H03B *7/14, 9/12*
U.S. Cl. 331—101 **3 Claims**



1. In a diode oscillator wherein an IMPATT diode is electrically connected between a center conductor and an outer conductor at a first end of a length of coaxial line and is biased through the center conductor, a termination load is disposed between such center conductor and such outer conductor adjacent a second end and an output port is formed through the outer conductor intermediate the IMPATT diode and the termination load, the improvement comprising:

(a) a first impedence transformer integrally mounted with the IMPATT diode;

(b) a second impedance transformer affixed to the center conductor between the IMPATT diode and the output port and slidably engaging the outer conductor; and

(c) means for applying a bias voltage through the center conductor and, simultaneously, for adjusting the position of the second impedance transformer relative to the first impedance transformer and the output port.

4,097,822

BROAD-BAND CAVITY-TUNED TRANSISTOR OSCILLATOR

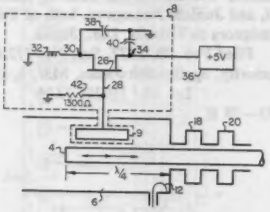
Robert Joly, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 713,007, Aug. 9, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 821,005
Int. Cl.[2] H03B *5/18, 7/06*
U.S. Cl. 331—101 **4 Claims**

1. An oscillator comprising:

a cavity structure having a translationally movable tuning plunger disposed therein;

negative resistive means having a capacitive coupling element disposed within the cavity structure for producing a signal having a selected frequency within a frequency range of substantially one octave, the coupling element having a selected thickness and length and located in the cavity so that the distance between the leftmost edge of the element and the end of the plunger positioned at the low frequency end of the frequency range is substantially equal to the distance between the right-most edge of the



element and the end of the plunger positioned at the high frequency end of the frequency range, for providing uniformity in variation of capacitance between the coupling element and the plunger as the plunger is moved; and

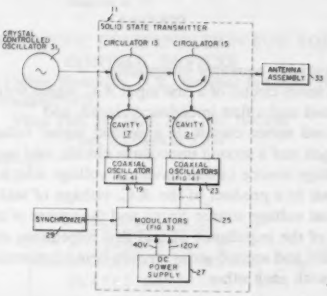
means coupled to the cavity structure for connecting the signal produced therein to an output.

4,097,823

TRANSMITTER WHEREIN OUTPUTS OF A PLURALITY OF PULSE MODULATED DIODE OSCILLATORS ARE COMBINED

George Jerinic, Acton; Glenn R. Thoren, Norwood; Francis J. Sullivan, Jr., Marlboro, and James L. Lampen, Burlington, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 30, 1977, Ser. No. 814,746
Int. Cl.[2] H03K *7/08*
U.S. Cl. 332—9 R **3 Claims**



1. A transmitter for radio frequency energy wherein pulses of radio frequency energy from each one of a plurality of diode oscillators are combined, the frequency of such pulses being determined by the frequency of a continuous wave signal out of a crystal-controlled oscillator, and the length and pulse repetition interval between such pulses being determined by periodic signals from a modulator, such transmitter comprising:

(a) the first combination of a first resonant cavity and at least one diode oscillator coupled thereto, such first combination being responsive to the continuous wave signal out of the crystal oscillator and to the periodic signals out of the modulator to amplify, periodically, the continuous wave signal; and

(b) the second combination of a second resonant cavity and the plurality of diode oscillators, such second combination being responsive to the amplified portions of the continuous wave signals out of the first combination and to the periodic signals out of the modulator to combine the

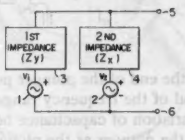
amplified portions into pulses of radio frequency energy to be transmitted.

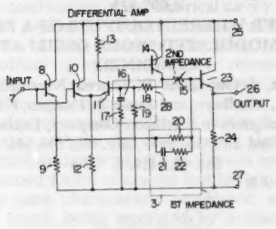
4,097,824

VARIABLE EQUALIZER

Kohei Ishizuka; Yasuhiro Kita, both of Hachioji; Yoshitaka Takasaki, and Junichi Nakagawa, both of Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 28, 1977, Ser. No. 772,677
Claims priority, application Japan, Mar. 1, 1976, 51-21144
Int. Cl.[2] H03H *7/14*
U.S. Cl. 333—28 R **4 Claims**





1. A variable equalizer comprising:

a first series circuit of a first input A.C. signal voltage source circuit and a first impedance circuit; and

a second series circuit of a second signal voltage source circuit and a second impedance circuit, said second signal voltage source circuit having a voltage which is proportional to a product of the A.C. voltage of said first input signal voltage source circuit and the square of the reciprocal of the impedance of said first impedance circuit;

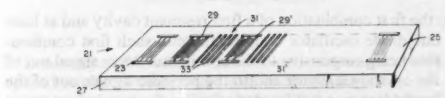
said first and second series circuits being connected in parallel with each other.

4,097,825

SURFACE ACOUSTIC WAVE TAPPED DELAY LINE

Henry M. Gerard, Capistrano Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 5, 1977, Ser. No. 757,128
Int. Cl.[2] H03H *9/30, 9/26, 9/32, 9/02*
U.S. Cl. 333—30 R **5 Claims**



1. A surface acoustic wave tapped delay line, comprising:

a. a substrate of material having a planar surface capable of supporting propagating surface acoustic wave energy;

b. input means including an input transducer disposed on said substrate surface for launching surface acoustic wave energy along a propagation path in response to an electrical input signal;

c. tapping means, including at least two spaced double electrode tapping transducers, disposed on said surface in said propagation path each for extracting a selected portion of said propagating surface acoustic wave energy; and

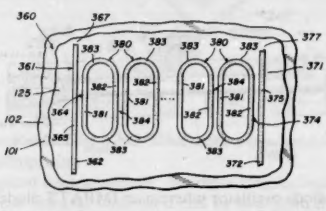
d. suppression means, including a grooved element array disposed in said surface between said tapping transducers, for reducing acoustic wave reflections at desired frequencies within a desired passband and suppressing spurious signals produced thereby.

4,097,826

INSULAR WAVEGUIDE RING RESONATOR FILTER

Robert M. Knox, La Grange, and Peter P. Toulios, Westchester, both of Ill., assignors to Epsilon Lambda Electronics Corp., Batavia, Ill.

Division of Ser. No. 592,065, Jun. 30, 1975, Pat. No. 3,995,238. This application Nov. 8, 1976, Ser. No. 740,011
Int. Cl.[2] H01P *1/20*
U.S. Cl. 333—73 R **16 Claims**

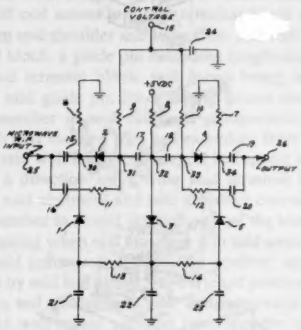


1. An insular waveguide band reject ring resonator filter for use in the frequency range from about 1 GHz to about 1,000 GHz comprising a conductive image plane, a first length of elongated high permittivity dielectric waveguide of finite cross section arranged in a closed ring form and disposed adjacent to said conductive image plane, a second length of elongated high permittivity dielectric waveguide of finite cross section disposed adjacent to said conductive image plane and spaced from first length of waveguide to provide a coupling region therebetween, and a thin film of synthetic organic resin disposed between and secured to said conductive image plane and said lengths of waveguide and extending laterally thereof, said thin film being low loss in character and having a low permittivity compared with that of said lengths of waveguide, said second length of waveguide having an inlet port at one end of said coupling region and spaced away from said first length of waveguide a distance substantially greater than the distance between said lengths of waveguide in said coupling region, said second length of waveguide having an outlet port at the other end of said coupling region and spaced from said first length of waveguide a distance substantially greater than the distance between said lengths of waveguide in said coupling region, said filter rejecting and blocking passage of energy from said inlet port to said outlet port when the means periphery of said first length of waveguide is an integral multiple of the guide wavelength of the energy in said first length of waveguide, said filter permitting passage of energy from said inlet port to said outlet port when the mean periphery of said first length of waveguide is other than an integral multiple of the guide wavelength of the energy in said first length of waveguide.

4,097,827
CONSTANT IMPEDANCE, CONSTANT PHASE PIN DIODE WITH ATTENUATOR

Mark R. Williams, West Melbourne, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 4, 1977, Ser. No. 765,711
Int. Cl.[2] H03H 7/24
U.S. Cl. 333—81 R 3 Claims



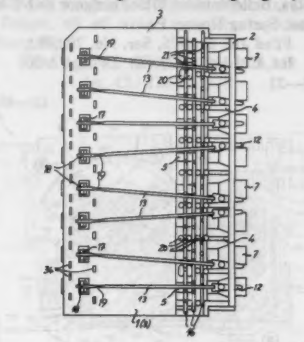
1. A constant impedance, constant phase PIN diode variable attenuator being comprised of a first PIN diode pi pad, having a RF input terminal, a second PIN diode pi pad having an output terminal and in series with said first PIN diode pi pad, said first and second PIN diode pi pads comprising three diodes each and sharing a common diode, and a control voltage applied simultaneously to said first and second PIN diode pi pads for variation of attenuation thereof.

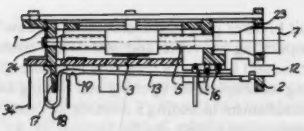
4,097,828
TUNING UNIT WITH BANDSWITCH FOR HIGH FREQUENCY RECEIVERS

Martin Hindermayr, Aying, and Ferdinand Wagner, Munich, both of Germany, assignors to Wilhelm Ruf KG, Munich, Germany

Filed Oct. 26, 1976, Ser. No. 735,714
Claims priority, application Germany, Nov. 6, 1975, 2549781
Int. Cl.[2] H03J 5/32
U.S. Cl. 334—7 12 Claims

1. Tuning unit with bandswitch for high frequency receivers having potentiometer means for the control of capacity diodes composed of a plurality of parallelly disposed resistance paths on which wipers are moved by means of screw tuning spindle means mounted beside one another in a common housing of insulating material, bandswitch means formed of metal wires associated with each tuning spindle means, said tuning spindle means being joined for rotation with sleeve means simultaneously forming operating knobs which are borne in apertures in the front plate and each sleeve means having an axial flange surface engaging the back side of the front plate about one aperture therein, said flange surface being slightly larger than



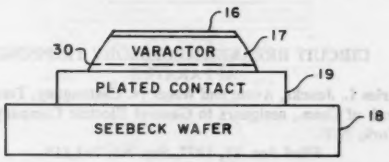


the cross section of the apertures and tapering conically away from the back side of the front plate.

4,097,829
THERMOELECTRIC COMPENSATION FOR VOLTAGE CONTROL DEVICES

Leonard D. Cohen, Brooklyn, N.Y., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Feb. 14, 1977, Ser. No. 768,480
Int. Cl.[2] H03J 3/04
U.S. Cl. 334—15 9 Claims



1. A device for compensating a thermally produced shift in the tuning characteristic of voltage controlled frequency tuning elements comprising:

(a) a Seebeck effect device with a voltage-temperature characteristic to produce a control correction voltage with a magnitude substantially equal to the thermally induced control voltage shift of the tuning element,

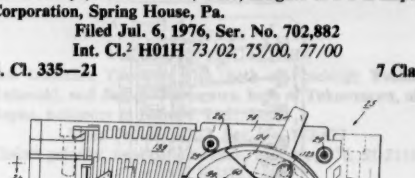
(b) means for thermally connecting said Seebeck device to said tuning element to cause the Seebeck device to experience substantially the same temperature change as the tuning element, and

(c) means for electrically connecting said Seebeck device to the control voltage circuit of said tuning element in voltage opposition to the thermally induced control voltage shift to cancel the effect of said thermally induced shift in the tuning characteristic of the tuning element.

4,097,830
LATCH FOR CONTACT OPERATING MECHANISM

Tadeusz J. Rys, Bellefontaine, Ohio, assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Jul. 6, 1976, Ser. No. 702,882
Int. Cl.[2] H01H *73/02, 75/00, 77/00*
U.S. Cl. 335—21 **7 Claims**



1. A circuit breaker pole unit including a narrow insulating housing, cooperating movable and stationary contact means disposed within said housing, a manually operable spring powered operating mechanism for opening and closing said contact means; said mechanism including a releaseable cradle and latch means for maintaining said cradle latched in an operating position wherein said operating mechanism is operable to close said contact means; automatic means for tripping said latch means responsive to predetermined abnormal current conditions thereby releasing said cradle whereby said contact means are opened by said mechanism; a metal frame within said housing; said latch means including a plate-like main section generally parallel to a wall of said frame and a latching section projecting angularly from said main sections and engageable by said cradle to maintain the cradle in said operating position; pin means extending between said main section and said wall providing a cantilevered pivotal mounting of said latch means to said frame for movement of said latch means about an axis generally at right angles to said main section and said wall; a link interposed between said latch means and said automatic means; said main section including a single aperture to receive a portion of said link to form a pivotal connection between the latter and said latch means.

4,097,831
CIRCUIT BREAKER ACCESSORY TRIPPING APPARATUS

Charles L. Jencks, Avon, and Roger N. Castonguay, Terryville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Jan. 21, 1977, Ser. No. 761,115
Int. Cl.[2] H01H *9/20*
U.S. Cl. 335—166 **21 Claims**

1. Accessory apparatus for tripping an electric circuit breaker, said apparatus comprises, in combination:

A. a support for mounting attachment to the circuit breaker;

B. first and second members mounted by said support for individual movements between respective reset and actuated positions;

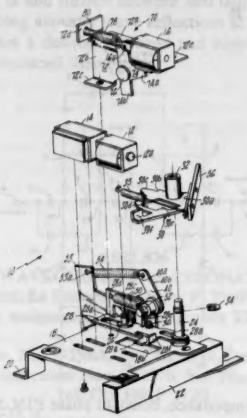
C. latch means carried by said second member for releasably latching said first member in its reset position while said second member assumes its reset position;

D. a third member mounted by said support for movement between actuated and reset positions;

E. a first spring connected between said first and third members, said first spring being charged while said first member is in its reset position and said third member is in its actuated position;

F. a second spring connected between said third member and said support, said second spring being charged while said third member is in its actuated position;

G. trip initiating means mounted on said support and operative to move said second member away from its reset position and thus unlatch said first member for movement to its actuated position under the influence of said first spring, the movement of said first member to its actuated



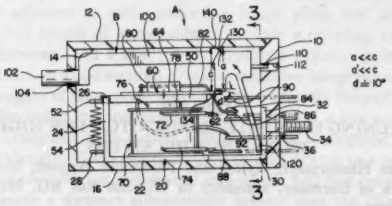
position serving to initiate tripping of the circuit breaker; and

H. means for coupling said third member to the breaker operating mechanism such as to achieve movement of said third member to its actuated position, and, upon tripping of the circuit breaker, said second spring discharges to restore said first, second and third members to their reset positions.

4,097,832
RELAY WITH MANUALLY RELEASABLE LATCH

Donald R. Ritzenthaler, Reedsburg, and Frederick E. Erickson, Baraboo, both of Wis., assignors to Gulf & Western Industries, Inc., New York, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,713
Int. Cl.[2] H01H *9/20*
U.S. Cl. 335—166 **11 Claims**



1. In a manual reset relay including a terminal support block, an armature pivotally mounted on a selected axis, coil means between said axis and said terminal block for forcing said armature into a first position adjacent said coil means when current is passed through said coil means, biasing means for biasing said armature away from said first position and toward a second position spaced from said coil means, a contact controlled by the angular position of said armature and a reset latching device, said latching device including latch means responsive to movement of said armature from said second position to said first position for releasably latching said armature in said first position and manual means for releasing said latch means and allowing said armature to pivot into said

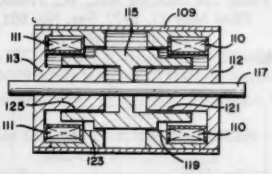
second position, the improvement comprising: longitudinally extending wall means secured with respect to said terminal block and extending over said armature and defining a clearance cavity between said wall means and said armature, said latching device including an integral latch member generally floating in said cavity and manually movable in a longitudinal direction generally perpendicular to said selected axis and parallel to said wall means, said latch member comprising an abutment having a generally flat shoulder extending laterally between said wall means and said armature and generally between said coil means and said terminal block and a wall inclined from said shoulder and away from said wall means and toward said block, a guide pin extending longitudinally into a recess in said terminal block, said recess being transversely larger than said guide pin for allowing lateral movement of said latch member in said cavity, a protuberance generally aligned with said inclined wall and extending from said member toward said wall means, an integral leaf spring biasing said member in a direction away from said terminal block, said shoulder of said abutment and said armature coacting to hold said latch member in a reset position against the biasing action of said leaf spring when said armature is in said second position and when said armature is in said first position, said member being biased by said leaf spring into a latched position with said protuberance and said inclined wall wedge between said armature and said wall means and said latch member including a portion protruding from said relay in a direction away from said terminal block for manually shifting said member from said latched position to said reset position.

4,097,833

ELECTROMAGNETIC ACTUATOR

John L. Myers, Dayton, Ohio, assignor to Ledex, Inc., Dayton, Ohio

Filed Feb. 9, 1976, Ser. No. 656,748
Int. Cl.[2] H01F 7/08
U.S. Cl. 335—261 **10 Claims**



1. An electromagnetic device comprising:

stator means comprising a first closed flux-carrying path including a core and an air gap opening in said core defined by first and second substantially parallel pole surfaces and a second closed flux-carrying path including a core and an air gap opening in said core defined by third and fourth substantially parallel pole surfaces,

coil means comprising means for generating electromagnetic flux in said first and second closed flux carrying paths, the direction of flux flow across said air gaps being substantially perpendicular to said pole surfaces, and

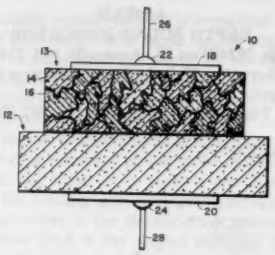
armature means mounted on said device to be movable between said first and second pole surfaces and between said third and fourth pole surfaces in a plane substantially parallel to said pole surfaces to overlap simultaneously varying areas of said first and second pole surfaces and said third and fourth pole surfaces in dependence upon the position of said armature means and to conduct therethrough varying portions of the flux in said first and second closed flux-carrying paths, the direction of flux flow in said armature means remaining substantially perpendicular to said pole surfaces.

4,097,834

NON-LINEAR RESISTORS

Kenneth M. Mar, Tempe; Kim Ritchie, Phoenix, and James N. Smith, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 12, 1976, Ser. No. 676,268
Int. Cl.[2] H01C 7/10
U.S. Cl. 338—21 **4 Claims**



1. A non-linear resistor comprising:

a semiconductor substrate having a first surface and a second surface;

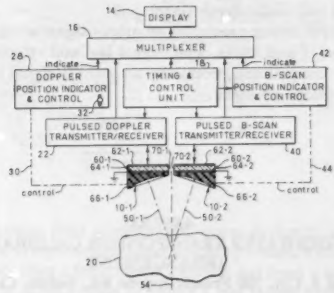
a thin layer of non-linear resistive material comprising a mixture of 40% to 95% by weight of a conductor material and 5% to 60% by weight of a dielectric material disposed on said first surface.

4,097,835

DUAL TRANSDUCER ARRANGEMENT FOR ULTRASONIC IMAGING SYSTEM

Philip S. Green, Atherton, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Sep. 20, 1976, Ser. No. 724,416
Int. Cl.[2] G01S 9/66
U.S. Cl. 340—1 R **18 Claims**



1. In an ultrasonic imaging apparatus of the type which includes different operating systems, such as systems which operate in the Doppler and B-scan modes, wherein the improvement comprises,

a dual transducer arrangement comprising first and second transducers associated with different operating mode systems of an ultrasonic imaging apparatus,

said first and second transducers each comprising a generally semicylindrical piezoelectric body formed with generally parallel semicircular opposite end surfaces and a flat side face,

electrodes disposed on the opposite end surfaces of the transducer bodies for connection to the different operating mode systems of the ultrasonic imaging apparatus,

means for focusing said transducers, and

means for relatively movably mounting said first and second

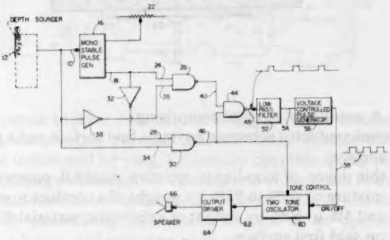
transducers at opposite sides of a mid-plane extending between the transducers with the flat side faces of the transducers closely adjacent said mid-plane.

4,097,836

DEPTH SOUND INDICATOR

Parvin Riddle, 2024 West St., Annapolis, Md. 21401, and Christopher I. Reynolds, Walpole, Mass., assignors to Parvin Riddle, Annapolis, Md.

Filed Feb. 10, 1977, Ser. No. 767,389
Int. Cl.[2] G01S 9/66
U.S. Cl. 340—3 C **12 Claims**



1. A water depth sounder indicating apparatus, said apparatus receiving at periodic intervals a constant amplitude water depth signal from a depth sounding device, the duration of said water depth signal having a direct relationship to the depth of water being measured by said depth sounding device, comprising:

a reference signal generator, said reference signal generator outputting a constant amplitude reference signal whose duration corresponds to a selected depth of water;

means for comparing the durations of said reference signal and said water depth signal; and

an output device producing an output signal when the durations of said water depth signal and said reference signal are unequal and producing no audible signal when said durations are equal.

4,097,837

UNDERWATER TRANSPONDER CALIBRATION ARRANGEMENT

Reginald J. Cyr, 700 Francis Botello Rd., Goleta, Calif. 93017

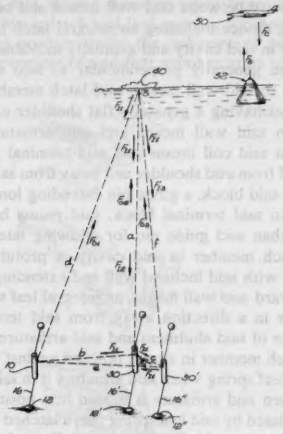
Filed Mar. 29, 1976, Ser. No. 671,675
Int. Cl.[2] G01S 9/66
U.S. Cl. 340—5 C **42 Claims**

37. In a method of calibrating an underwater transponder array comprised of a plurality of two transponders to determine the relative position between said transponders, and each of said transponders generating a different output signal in response to receiving a first interrogation signal, and a first of said transponders generating said first interrogation signal in response to receiving a second interrogation signal different from said first interrogation signal, the improvement comprising the steps of:

deploying said transponders to a spaced apart array adjacent the water bottom;

measuring the depth below the surface of the water of each of said transponders;

sequentially generating each of said first and said second interrogation signals from a location in the water within signal range of each of said transponders; and



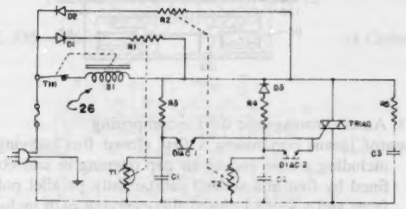
measuring the time period from interrogation signal transmission to receipt of said output signals from each of said transponders.

4,097,838

SEISMIC RODENT CONTROL DEVICE

Engelbert Fiala, 218 Dowling Ave., W., Transcona, Canada

Filed May 27, 1977, Ser. No. 801,103
Int. Cl.[2] H04B 11/00
U.S. Cl. 340—15 **16 Claims**



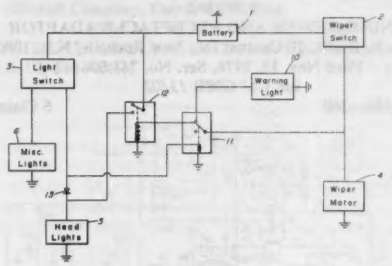
1. A device for disturbing the habitat or rodents, burrowing animals and the like, in conjunction with a source of electrical power; comprising in combination at least one frequency generator, casing means to support said generator, circuit means operatively connecting said generator to said source of electrical power, means to vary the frequencies generated by said generator, means to transmit vibration generated by said generator to the sub surface of the ground, said means to vary the frequency including at least two cycling thermostats operatively connected to said generator and to said circuit means for making and breaking the circuit means with said generator, a source of heat operatively connected to said thermostats to operate same in a random fashion and at random time intervals, said circuit means including means to connect and disconnect said source of heat with said thermostats coincident with the making and breaking of said circuit means with said generator.

4,097,839

WINDSHIELD WIPER SYSTEM ACTIVATED LIGHTING

Walter J. Lesiak, 112 Old Tavern La., Summerville, S.C. 29483

Filed Apr. 8, 1976, Ser. No. 674,966
Int. Cl.[2] B60Q *1/08, 1/20*
U.S. Cl. 340—52 R 8 Claims



1. A circuit for activating a pre-determined light means upon the activation of the windshield wiper system of a vehicle comprising:

(a) power means operative to provide power within said vehicle;

(b) switch means connected to said power means and operative to activate said windshield wiper system;

(c) activating means operative to activate said pre-determined light means;

(d) said pre-determined light means comprising exterior lighting on said vehicle; and

(e) said activating means comprising first relay means connected to said switch means and second relay connected to said power means and said pre-determined light means;

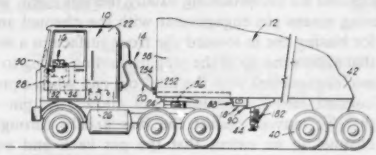
whereby when said switch means activates said windshield wiper system, said first relay means causes said second relay means to provide power from said power means to actiate said pre-determined light means.

4,097,840

AUTOMATIC SEMI-TRAILER LANDING GEAR EXTENSION AND RETRACTION APPARATUS

Warner A. Chappelle, 4801 NW. 69th, Oklahoma City, Okla. 73132

Filed Oct. 18, 1976, Ser. No. 733,230
Int. Cl.[2] B60Q *1/00*
U.S. Cl. 340—52 R 29 Claims



1. In a tractor trailer rig of the type which includes a conventional tractor having an operator's cab, a source of electrical power, and a fifth wheel hitch member; a semi-trailer having hitch pin means on the forward end portion for engaging the fifth wheel hitch member, road wheels journaled on the rear end portion and an alternately extendable and retractable landing gear mounted intermediate the hitch pin means and the road wheels; the landing gear having gear drive means operatively engaged therewith which gear drive means includes an input drive shaft adapted to be engaged by a crank handle for manual rotation thereof in a first direction to extend the landing gear to engage the ground and support the semi-trailer independently of the tractor and, alternately, in a second direction to retract the landing gear from the ground engaging position to allow the forward end portion of the semi-trailer to be supported by the tractor with the hitch pin means engaging the fifth wheel hitch member; an improved automatic landing gear extension and retraction apparatus comprising:

an electric drive motor mounted on the forward end portion of the semi-trailer and having a power output shaft;

means for drivingly connecting the power output shaft to the input drive shaft of the gear drive means of the landing gear;

position sensing means operatively connected to the landing gear for providing a first signal output when the landing gear is retracted and, alternately, for providing a second signal output when the landing gear is extended; and

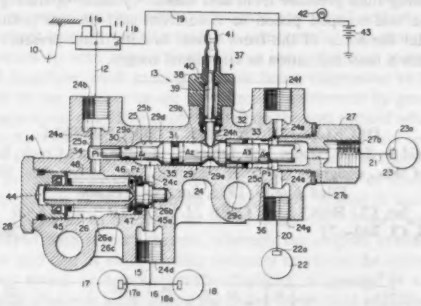
control circuit means mutually interconnecting the source of electrical power, the electric drive motor and the position sensing means, and responsive to external control thereof, for providing electrical power to the electric drive motor to rotate the input drive shaft in the first direction to extend the landing gear and, alternately, for providing electrical power to the electric drive motor to rotate the input drive shaft in the second direction to retract the landing gear.

4,097,841

BRAKING FLUID PRESSURE FAULT ALARM DEVICE

Katsumi Otsuka, Toyota; Noriakira Ishigami, Chiryu, and Asao Kozakai, Anjyo, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 568,389, Apr. 16, 1975, abandoned.
This application Oct. 14, 1976, Ser. No. 732,213
Claims priority, application Japan, Apr. 17, 1974, 49-44275
Int. Cl.[2] B60T *8/26, 11/34, 17/18*
U.S. Cl. 340—52 C 5 Claims



1. A braking fluid pressure fault alarm device for a vehicle dual brake system having brake actuating means, a front brake system including a front master cylinder and front wheel cylinders, a rear brake system including a rear master cylinder and rear wheel cylinders, conduit means operatively providing fluid communication between said master cylinders and said wheel cylinders for applying braking fluid pressure from said master cylinders to said wheel cylinders to brake said vehicle in response to operation of said actuating means, and proportioning valve means interposed between the rear master cylinder and the rear wheel cylinders of said rear brake system for developing proportioned rear wheel braking fluid pressure which is regulated in proportion to the rear wheel braking fluid pressure from said rear master cylinder, said fault alarm device comprising: signal means for generating a fault-indicating alarm signal when an alarm circuit is energized for closure; control valve means interposed between said master cylinders and said wheel cylinders and associated with said proportioning valve means, said control valve means including a body having therein a stepped cylinder which comprises a smaller diameter portion at its one end, a medium diameter portion at

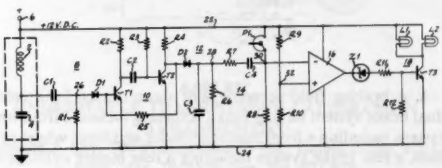
its intermediate portion, and a larger diameter portion at its other end; a stepped piston having a smaller diameter end portion defining an end face slidably but hermetically inserted in the smaller end portion of said stepped cylinder, a larger diameter intermediate portion defining together with said smaller diameter end portion a boundary face therebetween and slidably but hermetically inserted in the medium diameter intermediate portion of said stepped cylinder and a medium diameter other end portion defining an end face and disposed in the larger diameter other end portion of said stepped cylinder; a sleeve defining an end face and slidably but hermetically interposed between the medium diameter other end portion of said stepped piston and the larger diameter other end portion of said stepped cylinder; said stepped piston being axially movable to a neutral position and in axially opposed directions therefrom; switch means engaged with said stepped piston of said control valve means for energizing said alarm circuit in response to the sliding movement of the stepped piston of said control valve means from its neutral position; and connecting means for applying the rear wheel braking fluid pressure from said rear master cylinder to the end face of the smaller diameter end portion of said stepped piston, the proportioned rear wheel braking fluid pressure from said proportioning valve means to the boundary face between the smaller diameter end portion and the larger diameter intermediate portion of said stepped piston, and the front wheel braking fluid pressure from said front master cylinder to the end faces of both of said sleeve and the medium diameter other end portion of said stepped piston; said end face of said medium diameter other end portion of said stepped piston having a greater surface area than said end face of said smaller diameter end portion of said stepped piston; with deterioration of the proportioned rear wheel braking fluid pressure between said proportioning valve means and said rear wheel cylinders occurring as a result of fault in said proportioning valve means despite increases in the rear wheel braking fluid pressure from said master cylinder operating to urge said stepped piston to slide from said neutral position under the force of the front wheel braking fluid pressure to insure a fault indication in said signal means.

4,097,842

DECELERATION INDICATION SYSTEM

David R. Zalar, Wales, and James E. Hansen, Oak Creek, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Aug. 9, 1976, Ser. No. 712,808
Int. Cl.[2] B60Q *1/26*; G08B *21/00*; G01P *3/42, 15/00*
U.S. Cl. 340—71 **7 Claims**



1. A deceleration indication system adapted to be connected to the ignition system of a leading motor vehicle to provide a signal to the following driver whenever the engine speed of the leading motor vehicle decreases comprising:

a tachometer operable to receive input pulses from the ignition system of the leading motor vehicle indicative of engine speed and to provide respective uniform-width control pulses having a frequency proportional to said engine speed and variable therewith;

a voltage control circuit responsive to said control pulses for providing a voltage change having a positive slope when said pulse frequency is increasing on engine acceleration or a voltage change having a negative slope when said pulse frequency is decreasing on engine deceleration;

a slope detector and comparator means responsive to said voltage change having a negative slope for providing an output voltage;

an indicator;

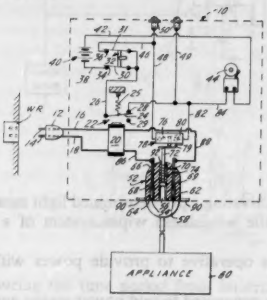
and means responsive to said output voltage for operating said indicator.

4,097,843

WARNING DEVICE AND RECEPTACLE ADAPTOR

Sebastian B. Basile, 20 Coutant Dr., New Rochelle, N.Y. 10804

Filed Nov. 12, 1976, Ser. No. 741,506
Int. Cl.[2] G08B *13/02*
U.S. Cl. 340—280 **5 Claims**



1. A warning device for indicating loss of power to an electrical unit from a power source by power failure or by disengagement of a plug between the electrical unit and power source, which comprises:

a relay switch having a coil and a spring-biased blade which moves to and from a contact, and is biased against the contact and drawn away from the contact and held toward the coil when the coil is energized,

means connected to the relay switch for connecting the relay switch across a power source,

a receptacle adaptor for receiving the blades and grounding prong of a grounded plug, including

a housing having front and back surfaces,

contact members extending into the housing from its front surface for receiving the grounded plug blades,

a channel pin the housing for receiving the plug grounding prong, the channel extending through the housing from its front to back surfaces,

a pin having a front end and a back end, mounted in the channel for reciprocating axially therethrough, and

biasing means pin engagement with the channel and pin for biasing the in toward the front surface in a manner that allows the tip of the plug grounding prong to come into engagement with the pin front end when a prong is inserted into the channel, and allows the pin to be thereby moved against the bias axially through the channel to an extent that the pin back end extends beyond the housing rear surface,

a second switch connected to the relay contact, the second switch having a contactor and means for rendering the pin communicable with the contactor, such that the second switch is closed when the grounding prong is removed from the receptacle channel and the pin is moved axially to its spring-biased position, and

an on-off switch having two poles, one pole being connected to the relay blade, for activating and de-activating the warning device,

a battery having one pole connected to the other pole of the on-off switch, and

alarm means connected between the on-off switch and the battery, and between the battery and the on-off and second switches, said alarm means being activated when

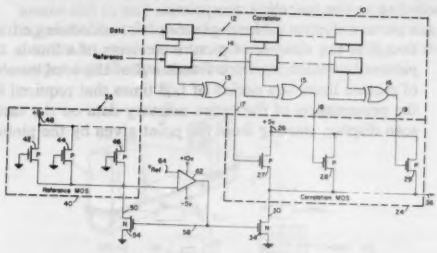
power to the relay is lost or when the grounding prong is withdrawn from the receptacle adaptor.

4,097,844

OUTPUT CIRCUIT FOR A DIGITAL CORRELATOR

Norman E. Moyer, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 4, 1977, Ser. No. 784,499
Int. Cl.[2] G06F *7/04;* G05B *1/03;* H03K *4/02, 5/20*
U.S. Cl. 340—146.2 **13 Claims**



1. A circuit responsive to a plurality of correlation signals comprising:

a correlation circuit including a plurality of transistors having their current paths connected in parallel between a first voltage source and a first common lead, and having their control electrodes responsive to said correlation signals,

a first load transistor having its current path coupled between said first common lead and a second voltage source, said first load transistor having a control electrode; and

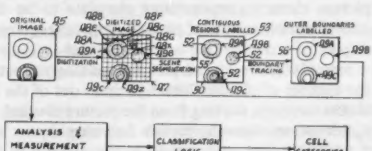
a compensating circuit coupled to the control electrode of said first load transistor for controlling the resistance of said first load transistor to provide a substantially constant voltage step on said common lead for each parallel transistor biased into conduction.

4,097,845

METHOD OF AND AN APPARATUS FOR AUTOMATIC CLASSIFICATION OF RED BLOOD CELLS

James W. Bacus, Hinsdale, Ill., assignor to Rush-Presbyterian-St. Luke's Medical Center, Chicago, Ill.

Continuation-in-part of Ser. No. 737,531, Nov. 1, 1976, abandoned. This application Aug. 18, 1977, Ser. No. 825,673
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 CA **18 Claims**



1. An apparatus for automatically classifying red blood cells in a blood specimen comprising means for examining a plurality of red blood cells in the blood specimen, means for classifying individual abnormal red blood cells examined by its respective features into one of several abnormal cell subpopulations, and means for reporting the red blood cells in at least one of the respective abnormal cell subpopulations.

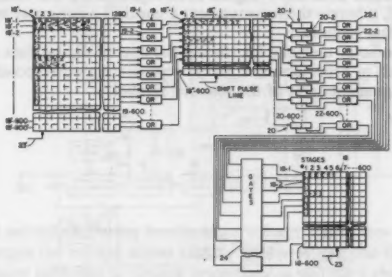
4. An apparatus for classifying red blood cells comprising means for examining a plurality of red blood cells for identifying features including a central pallor or a lack thereof, and means for classifying into one of several different and mutually exclusive subpopulations those red cells having a central pallor and those red cells lacking a central pallor.

4,097,846

DATA STORAGE AND RETRIEVAL SYSTEM

Gary Lewis, St. Clair Shores, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Apr. 8, 1977, Ser. No. 786,117
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 H **37 Claims**



1. In a data storage and retrieval system including a recording medium having recorded thereon information in the form of patterns of energy transmitting or non-transmitting microsized image-forming spots surrounded by the other of same and contained within an image field divided into a number of lines of equally spaced potential image-forming spot locations; the improvement in means for retrieving the recorded data represented by the image-forming spots in said image field, said data retrieving means comprising image sensing means including one or more energy sensing elements positioned actively to intercept image spots directed in a substantially non-centered relationship with respect thereto from image-forming spots in said locations, each sensing element being responsive to the parts of one or more image spots impinging thereon by generating a signal of a value depending upon the area thereof which intercepts the image spot or spots involved, each of said sensing elements being at all times much smaller in size than the image spots intercepted thereby so that a number of sensing elements are required in both orthogonally related X and Y axis directions to intercept an entire image spot if they were centered with respect thereto, whereby the outputs available from said one or more sensing elements represent the outputs of an actual or hypothetical multiplicity of groups of said sensing elements intercepting the entire image field and where each group thereof are contiguous and of a size to intercept a single image spot when centered with respect thereto, and means for "OR" gating said sensing element signals representing the respective outputs of each of said different groups of said actual or hypothetical multiplicity of groups of sensing elements, to produce signals representing the patterns of image-forming spots in the image field of said recording medium.

4,097,847

MULTI-FONT OPTICAL CHARACTER RECOGNITION APPARATUS

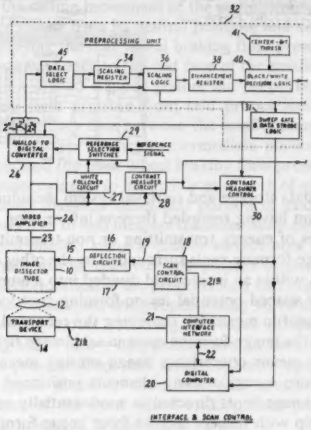
George E. Forsen, Glastonbury, and Stephen F. Jackson, East Hartford, both of Conn., assignors to Scan-Optics, Inc., East Hartford, Conn.

Continuation of Ser. No. 270,192, Jul. 10, 1972, abandoned. This application May 14, 1975, Ser. No. 577,151
Int. Cl.[2] G06K *9/16*
U.S. Cl. 340—146.3 AE **8 Claims**

1. Multi-font optical character recognition apparatus for converting character representative symbols located on a storage medium in the form of a two-dimensional field of brightness values into a digital code representative of said

symbol, said apparatus including scanning means for optically scanning the storage medium to generate analog signals representative of the brightness values, contrast means for measuring the difference between the analog signals produced by the various brightness values, means for converting the analog signals into one bit digital data signals denoting either blackness for the symbol or whiteness for the background in dependence on the measurement of the contrast means, perimeter trace means for developing contour digital data representative of incremental movements between data points about the perimeter of the symbol, and recognition means for converting the contour data into a digital code representing the scanned symbol, wherein the improvement comprises a perimeter tracing means including:

a character memory for storing the one bit digital data signals in predetermined arrays representing corresponding segmental areas of the scanned symbol,



address means for addressing particular data bits in the character memory,

a perimeter trace table memory for storing a search sequence for finding the perimeter of the character, and

control means for causing the address means to follow the search sequence stored in the perimeter trace table so that the perimeter of the symbol stored in the character memory is searched for in a 5 × 5 array of a portion of the character memory according to the following sequence: row 2, col. 1; row 2, col. 2; row 2, col. 3; row 1, col. 2; row 1, col. 3; row 1, col. 4; row 2, col. 4; row 3, col. 4; row 2, col. 5; row 3, col. 5; row 4, col. 5; row 4, col. 4; row 4, col. 3; row 5, col. 4; row 5, col. 3; row 5, col. 2; row 4, col. 2; row 3, col. 2; row 4, col. 1; row 3, col. 1; row 2, col. 1; stopping in the search whenever a part of the perimeter is found, and beginning a new search with a shifted 5 × 5 array.

4,097,848

READOUT UNIT FOR DATA STORED IN A RANDOM-ACCESS MEMORY AND PRESENTED ON A RASTER SCAN DISPLAY IN ACCORDANCE WITH A GIVEN LINE PATTERN

Antoon Hendrikus Brands, Borne; Jouke Gietema, Hengelo, and Hendrik Cornelis Bleijerveld, Borne, all of Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Mar. 3, 1977, Ser. No. 773,909

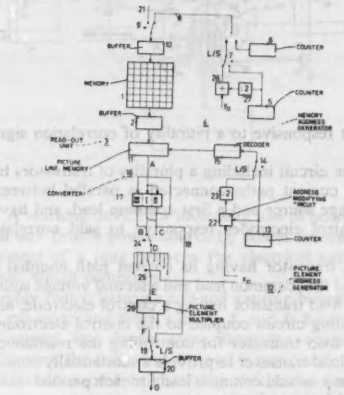
Claims priority, application Netherlands, Mar. 26, 1976, 7603159

Int. Cl.[2] G11C *11/26*

U.S. Cl. 365—118 **1 Claim**

1. A readout unit for data stored in a random-access memory and presented on a raster scan display in accordance with a predetermined line pattern, the random-access memory including N × N simultaneously accessible submemories each containing $a \times a$ memory elements, for each picture line the relevant data is readout in q bits simultaneously from each of the respective N submemories in a cycle of the random-access memory, and the readout unit contains at least one picture line memory for storing the data representing a picture line for being readout in the sequence as required for presentation on the raster scan display, wherein, in order to display a fraction β^2 ($\beta = 1, \frac{1}{2}, \frac{1}{3}, \ldots$) of the data stored in the random-access memory on the whole of the raster, starting from a point given by the picture element coordinates (x_o, y_o), the readout unit according to the invention comprises:

a. a picture element address generator for addressing a fraction β of the number of picture elements of a line in the picture line memory, for a fraction β of the total number of picture lines, in a period of $1/\beta$ times that required for the presentation of the entire memory data on the raster scan display, starting from the point given by the picture



element coordinates (q.integer[x_o/q], y_o), such that the data stored in the picture line memory is readout in the same groups of q bits as stored in the picture line memory in the sequence as required for the picture line reproduction;

b. a picture element converter for delivering, on the reception of said groups of q bits, new successive groups of q bits representing the memory data to be displayed for each picture line fraction, starting from the picture element abscissa x_o;

c. a picture element multiplier for multiplying the number of picture elements representing the data to be displayed until the total number of picture elements required for the display of a picture line is obtained; and

d. a memory address generator for reading a fraction β of the number of picture lines $1/\beta$ times out of the random-access memory, starting from the picture element ordinate y_o, for storage into the picture line memory.

4,097,849

ELECTRONIC COMPARATOR FOR PROCESS CONTROL

Francis M. Taylor, Xenia, Ohio, assignor to Systems Research Laboratories, Inc., Dayton, Ohio

Filed Sep. 27, 1976, Ser. No. 726,990

Int. Cl.[2] G01B *11/06*

U.S. Cl. 340—213 Q **7 Claims**

1. In an optical micrometer for measuring a dimension of an article within a zone of measurement, said optical micrometer generating input data in the form of pulses during each measurement interval representing the dimension of the article, the improvement comprising

first counter means for receiving said input data during each measurement interval,

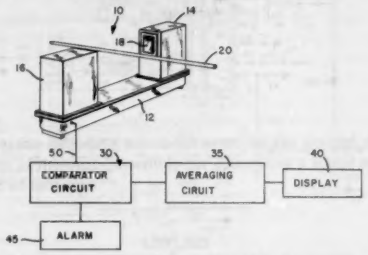
means for generating a command pulse following each measurement interval,

second counter means responsive to said command pulse for receiving the input data from said first counter means,

output register means for storing the data from the previous measurement interval,

third counter means responsive to said command pulse for receiving the input data from the previous measurement interval,

clock means for supplying pulses to said output register means and to said second and third counter means following said command pulse for causing said counter means to decrement, said counter means each providing a zero output signal upon reaching a zero count,



gate means for transferring the remaining data from the other of said second or third counter means to a comparison circuit when one of said second or third counter means reaches zero,

said comparison circuit comparing the number remaining in said other counter means with a preset, adjustable number,

circuit means responsive to the output of said comparison circuit for controlling the operation of said clock means for

a. terminating said clock means when said second counter means reaches zero, provided said deviaition limit is not exceeded, and

b. terminating the operation of said clock means when said third counter means reaches zero, provided said deviation limit is exceeded,

whereby said output register means contains either new input data, if within predetermined limits, or previous input data.

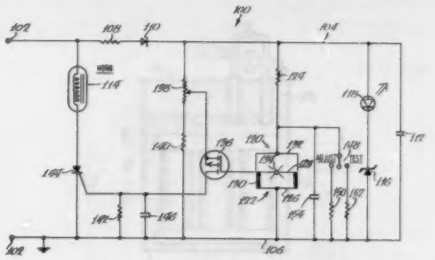
4,097,850

MEANS FOR ADJUSTING AND FOR TESTING A DETECTING DEVICE

Frederick J. Conforti, Aurora, Ill., assignor to Pittway Corporation, Northbrook, Ill.

Filed Nov. 1, 1976, Ser. No. 737,388
Int. Cl.[2] G08B *29/00*
U.S. Cl. 340—214 **11 Claims**

1. In a warning device, detecting means responsive to the presence of predetermined phenomena, said detecting means having first and second electrodes for receiving a nominal value voltage thereacross and a third electrode exhibiting a voltage in accordance with said nominal value voltage in the absence of said phenomena and at least a first amount of change in voltage upon the presence of said phenomena in predetermined concentrations; means for applying said nominal value voltage across said first and second electrodes, and means for selectively changing the value of the voltage across said first and second electrodes either by one discrete amount sufficient in the absence of said phenomena to change the voltage at said third electrode by said first amount or by another discrete amount sufficient to change the voltage at said third electrode by a second and greater amount, said means for changing including first and second resistors each connected at one end with said second electrode, and a switch connected with said first electrode and opposite ends of said resistors and actuable to selectively connect either or neither of said resistors across said first and second electrodes, said first and second electrodes having said nominal value voltage thereacross when neither said first nor said second resistor is connected thereacross, said first resistor when connected across said first



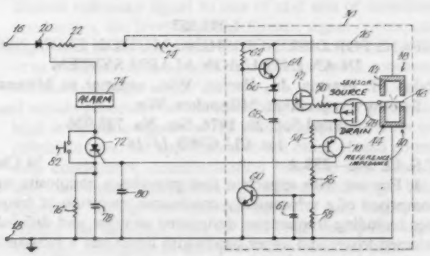
and second electrodes developing a voltage thereacross which changes the voltage across said electrodes by said one discrete amount sufficient to change the voltage at said third electrode by said first amount, said second resistor when connected across said first and second electrodes developing a voltage thereacross which changes the voltage across said electrodes by said another discrete amount sufficient to change the voltage at said third electrode by said second amount.

4,097,851

SENSITIVITY COMPENSATED FIRE DETECTOR

Roy W. Klein, Hoffman Estates, Ill., assignor to Pittway Corporation, Northbrook, Ill.

Filed Jul. 19, 1976, Ser. No. 706,685
Int. Cl.[2] G08B *17/10*
U.S. Cl. 340—237 S **17 Claims**

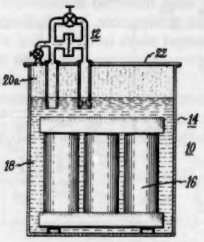


1. In a detecting device, a detector circuit having terminals for receiving a voltage thereacross and an impedance between said terminals which changes in value in accordance with the presence or absence of predetermined phenomena, for providing a first electric signal which changes relatively rapidly in value in response to the occurrence of said phenomena, means for generating in response to said first signal a second electric signal which changes in value in response to changes in value of said first signal, and means for monitoring the value of said second signal and for controlling said generating means to maintain said second signal at substantially a first predetermined value independent of said voltage across and impedance of said detector means for constant and relatively slowly changing values of said first signal, said second signal having at least a second predetermined value upon the occurrence of said phenomena.

4,097,852
FAULT DETECTOR FOR LIQUID IMMERSED INDUCTIVE APPARATUS

Gerald O. Usry, Rome, Ga., assignor to General Electric Company, New York, N.Y.

Filed Sep. 22, 1976, Ser. No. 725,479
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—242 **27 Claims**



1. Apparatus for detecting pressure changes within an enclosure for electrical inductive apparatus containing a liquid and a gas, wherein said gas is located in a space above and is in contact with said liquid, comprising:

(a) a first gas containing chamber having a flow restricting opening of predetermined size therein, at least one end of said first chamber, flow restricting opening being immersed in said liquid;

(b) a second gas containing chamber having an opening therein that is of the free-flow type relative to the opening in said first chamber, said second chamber opening, being immersed in said liquid;

(c) means for equalizing the pressure of gas contained in said first chamber, said second chamber, and said space above said liquid; and

(d) means for determining when the pressure in one of said chambers changes with respect to the pressure in the other of said chambers.

4,097,853
MEANS FOR DISTINGUISHING MOTION FROM NOISE IN AN INTRUSION ALARM SYSTEM

Ralph M. Francis, Jr., Racine, Wis., assignor to Milwaukee Resistor Corporation, Milwaukee, Wis.

Filed Sep. 20, 1976, Ser. No. 725,026
Int. Cl.[2] G08B 13/16
U.S. Cl. 340—258 A **24 Claims**

1. For use with apparatus that provides a composite signal comprised of a substantially continuous spectrum of frequencies including frequencies designated as noise and defined by selected lower and upper bandwidth limits and a substantially predetermined band of frequencies coincident with a portion of said spectrum designated as the desired information band having lower and upper bandwidth limits within said spectrum; means for discriminating signals corresponding with frequencies within said information band from signals corresponding with noise, comprising:

first amplifier means having input and output means, said input means including means for receiving said composite signal and said amplifier means having a bandwidth response corresponding substantially with said predetermined bandwidth of said noise, said amplifier means producing an unclipped output signal corresponding with said composite signal within said noise band,

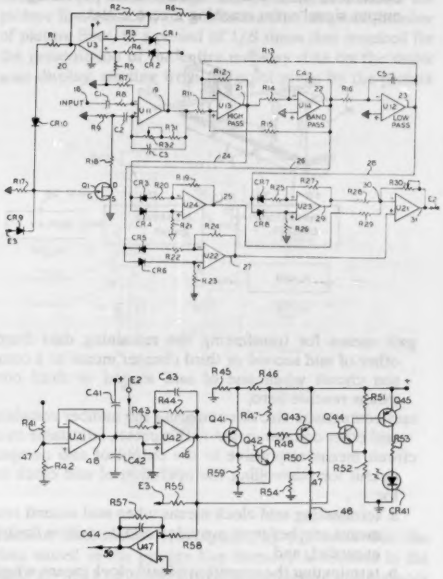
means for substantially separating from said output signal signals which correspond with said information frequency band from signals which correspond with said noise frequencies,

means for converting said information and noise signals, respectively, to corresponding absolute value signals,

means for producing a reference potential,

amplifier means having input means for said absolute value signal corresponding with said noise signal and input means for said absolute value signal corresponding with said information signal, said last named amplifier means being constructed and arranged to produce an alternating output signal which is proportional to the difference between said noise and information input signals and which has a dc offset relative to said reference potential having a polarity that depends upon which of said noise and information corresponding signals is greater,

means for converting said alternating output signal from said last named amplifier means to a signal related to time and



having a polarity relative to said reference potential which is functionally related to the polarity of said offset signal and corresponds with which of said noise signal or said information signal is dominant,

feedback means coupling said signals which are related to time to said input means of said first amplifier means, said feedback mens being responsive to signals having a polarity corresponding with noise for reducing the sensitivity of said first amplifier means proportionately to the magnitude of the noise component of said signals, and

means responsive to said time related signal reaching a predetermined amplitude of one polarity for indicating the existence of a predominant information signal.

4,097,854
SENSING MECHANISM FOR MINE ROOF BOLTING APPARATUS

Sigmund Black, Belle Mead, and James L. Finney, Cranbury, both of N.J., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

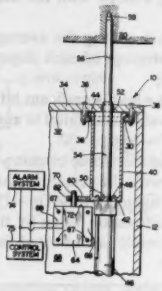
Filed Mar. 4, 1977, Ser. No. 774,354
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—282 **11 Claims**

1. In combination with a mine roof bolting apparatus, a sensing mechanism comprising:

means secured to said roof bolting apparatus and operatively engaged with the roof of a mine for sensing any shift of

said roof bolting apparatus with respect to said mine roof, in any direction within a horizontal plane,

said means having a vertically movable probe assembly for embedding and fixing the sensing mechanism in a fixed position with respect to the mine roof,



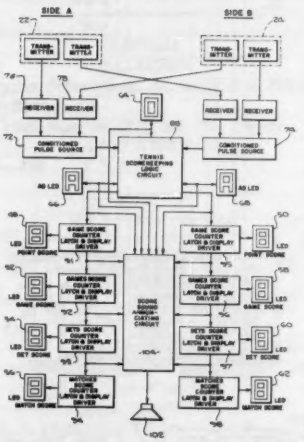
said means including means actuated by the pivotal movement of the probe assembly for generating a signal indicative of said shift.

4,097,855

ELECTRONIC TENNIS SCORING SYSTEM

Gaetano Salvo, 6117 Reseda Blvd., Reseda, Calif. 91335

Filed Nov. 25, 1977, Ser. No. 854,662
Int. Cl.[2] G08B *23/00, 5/36*
U.S. Cl. 340—323 R **14 Claims**



1. An electronic scoring system for keeping score between two opposing sides each including one or more opponents, comprising:

a first electronic transmitting device to be selectively actuated by one side to indicate which side won each successive point;

a second electronic transmitting device to be selectively actuated by the other side to indicate which side won each successive point;

receiving and scoring means for initially storing a preliminary indication as to who won each successive point;

additional logic circuit means for preventing the full recording of the preliminary indication if it is disputed by the other side; and

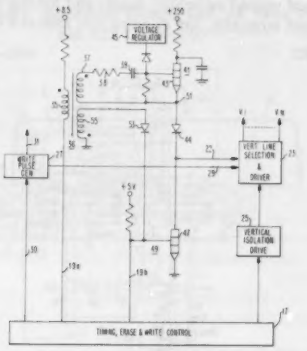
means for fully recording the point if it is not disputed, and for displaying the resultant score.

4,097,856

GAS PANEL SINGLE ENDED DRIVE SYSTEMS

William Roger Lamoureux, Kingston, and James Bryce Trushell, Saugerties, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,056
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 M **7 Claims**



1. A gas discharge display storage system adapted for low level logic control of a high level driving system during the normal sustain sequence of said system comprising in combination,

a gas panel comprising an envelope filled with an illuminable gas,

first and second sets of dielectrically coated coordinate conductors positioned in orthogonal relationship on opposite sides of said envelope, the intersections of said conductors defining gas cells in the region of each of said coordinate intersections,

a sustain generator associated with each of said sets of coordinate conductors,

said sustain generator comprising means for applying a continuous reference signal to one of said sets of coordinate conductors, the level of said reference signal corresponding to that of the associated logic circuits to permit continuous communication between said coordinate conductor set and said logic circuits,

said sustain generator further including means for generating high level pulse signals of full sustain amplitude from said reference level for application to the other of said coordinate conductors, communication between said other of said coordinate conductors and said control logic being provided during the interval between said high level pulses, the algebraic sum of said level and pulse signal effecting discharge of said previously selected cells.

4,097,857

APPARATUS FOR SELECTIVELY DISPLAYING ANALOGUE QUANTITIES OF PLURAL INPUT DATA SIGNALS

Nobuaki Miyakawa, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed May 11, 1976, Ser. No. 685,697
Claims priority, application Japan, May 16, 1975, 50-57312
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 R **2 Claims**

1. An apparatus for selectively displaying analogue quantities of plural input data signals, comprising:

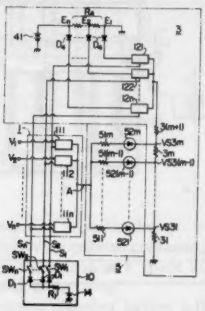
a plurality of input means for receiving a corresponding plurality of input voltages of said data signals;

first switching means having a plurality of input terminals connected to said input means and having an output terminal for selectively providing one of said input voltages;

reference voltage generating means for generating a plurality of reference voltages corresponding to said data signals;

second switching means having a plurality of input terminals connected to said reference voltage generating means and having an output terminal for selectively providing one of said reference voltages corresponding to said one of input voltages selected by said first switching means;

voltage dividing means having an input terminal connected to said second switching means and having a plurality of output terminals, for dividing the selected one of refer-



ence voltages into a plurality of predetermined different voltages, and respective output terminals being provided for said respective predetermined different voltages;

means for generating a plurality of switching signals for driving said first and second switching means and for selectively providing one of said switching signals to said first and second switching means; and

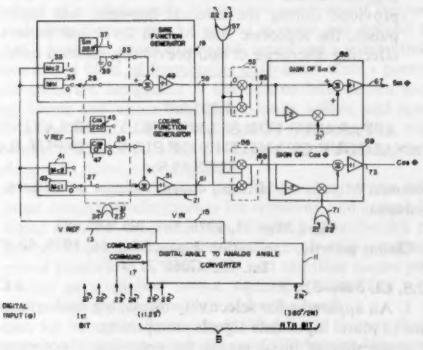
display means including a plurality of light emitting diodes each connected between the output terminal of said first switching means and a respective output terminal of said voltage dividing means for providing a luminant display for the selected one of said input data signals.

4,097,858

DIGITAL TO ANALOG RESOLVER CONVERTER

Carl Stella, Valencia, Calif., and David Julian Simon, Saddle Brook, N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Oct. 8, 1975, Ser. No. 620,740
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 SY **10 Claims**



1. A method utilizing electronic circuitry for converting an *m* bit digital voltage signal representing an angle over an octant, which is a portion of an *n* bit digital voltage signal representing the angle from 0° to 360°, into an analog voltage signal representing a continuous periodic function of the angle to be used as an output of a digital to analog resolver converter, comprising:

(a) dividing the continuous periodic function of the angle into an even number *p* of equal angular segments, each segment having a slope with the same sign over the full segment;

(b) determining and storing the average slope of each segment and the intercept of each slope segment in the electronic circuitry;

(c) converting the *r* least significant bits of the digital signal into an analog value in a digital to analog converter where *r* is equal to $m - \log_2 p$;

(d) selecting in said electronic circuitry a slope and intercept in accordance with the remaining $\log_2 p$ bits of the *m* bit digital voltage signal and the (m+1)th bit; and

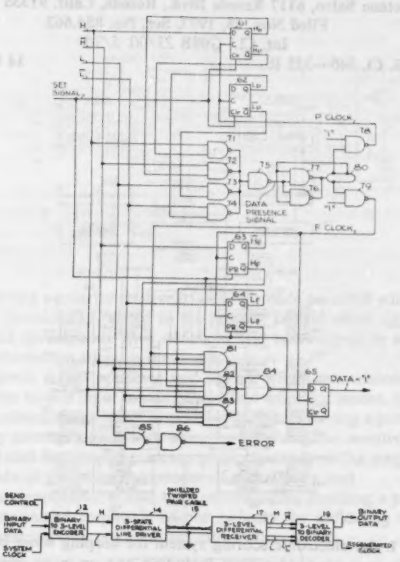
(e) multiplying said analog value by the selected slope and adding to the result the selected intercept in said electronic circuitry.

4,097,859

THREE-LEVEL TO TWO-LEVEL DECODER

Floyd William Looschen, Laguna Beach, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 1, 1976, Ser. No. 737,783
Int. Cl.[2] H03K *13/00*
U.S. Cl. 340—347 DD **6 Claims**



1. For use in a three-level digital data transmission system, the combination comprising:

means for providing binary signals H, H, L and L indicative of the levels of a self-clocking three-level digital signal having high, low and intermediate levels;

means responsive to said H, H, L and L signals for detecting data presence;

means responsive to the detection of data presence for generating a clock signal at a predetermined time after the detection of data presence; and

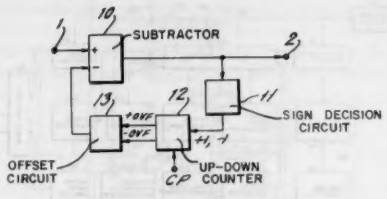
means responsive to said H, H, L and L signals and said clock signal for producing a binary output signal representative of a decoded binary form of said three-level signal.

4,097,860

OFFSET COMPENSATING CIRCUIT

Takashi Araseki; Kazuo Ochiai, and Rikio Maruta, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1977, Ser. No. 766,848
Claims priority, application Japan, Feb. 10, 1976, 51-14144
Int. Cl.[2] H03K *13/02, 13/32*
U.S. Cl. 340—347 CC 9 Claims



1. An offset compensating circuit comprising: a subtractor for subtracting a presumed value of the offset from the input signal to form the output signal; a sign decision circuit for determining an algebraic sign of the output signal of said subtractor circuit; a clock pulse source; a bidirectional counter for counting pulses from said source having its count-up and count-down function controlled by the output signal of said sign decision circuit and adapted to produce respective output signals when it has overflowed in an increasing direction and in a decreasing direction; and an offset setting circuit in which an internal setting value representing the presumed value of the offset is increased upon overflow of said counter in the increasing direction while said internal setting value is decreased upon overflow of said counter in the decreasing direction.

4,097,861

D.C. HORN

George R. Pariza, Schaumburg, Ill., assignor to Pittway Corporation, Northbrook, Ill.

Filed Mar. 14, 1977, Ser. No. 776,952
Int. Cl.[2] G10K *9/12*
U.S. Cl. 340—388 10 Claims

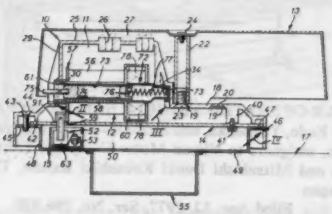
1. An improved horn for generating an audible signal, comprising a housing formed of electrically conductive material having walls he margins of which define an opening; an electromagnetic coil within said housing and having a pair of terminals connected to opposite sides of a winding thereof and extending exteriorly of said housing; a diaphragm of electrically conductive material positioned on said housing in electrical contact therewith over said opening and closing said housing; a striker member of magnetically permeable and electrically conductive material; and means for mounting said striker in said housing between said diaphragm and said coil in operative association with said coil for movement away from and strikingly against said diaphragm to generate noise, said means normally resiliently urging said striker toward and into electrical contact with said diaphragm, electrically insulating said striker from direct electrical contact with said housing and said coil terminals, and including a terminal extended exteriorly of said housing and electrically connected with said striker.

4,097,862

ACOUSTIC WARNING DEVICE, IN PARTICULAR A BELL

Yves Brionne, Pau, France, assignor to Legrand S.A., Limoges, France

Filed Dec. 23, 1976, Ser. No. 754,022
Claims priority, application France, Dec. 24, 1976, 75 39663
Int. Cl.[2] G08B *3/00*
U.S. Cl. 340—396 26 Claims



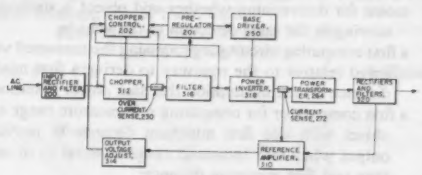
1. An acoustic warning device comprising, a striker member forming a movable core of a control solenoid and arranged to strike resonator means in response to energization of said solenoid, permanent magnet means adapted to define in cooperation with retaining means a rest position for the striker member, said permanent magnet means being in coaxial alignment with the solenoid and disposed beyond one end of said solenoid, said permanent magnet means having radial pole lines with the same polar orientation, one end of said movable core proximate to said permanent magnet means extending only partly into the axial zone corresponding to the axial extent of said permanent magnet means.

4,097,863

MARINE RADAR SYSTEM WITH INDEPENDENT SWITCHED POWER SUPPLIES

Derek Chambers, Bedford, N.H., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 6, 1976, Ser. No. 712,300
Int. Cl.[2] G01S *9/00;* H02M *3/22*
U.S. Cl. 343—5 R 3 Claims



1. In combination:
means for transmitting radar pulse signals at a first rate;
means for providing digital samples of radar return signals at a second rate;
switching power supplying means including a switching regulator feeding an inverter having a frequency above the audible range for providing electrical power to said transmitting means and said digital sample providing means, said switching power supplying means operating at a third rate;
means for preventing interference effects by operating said third rate intermediate said first and second rate, said second rate being variable with the radar range setting;
means for providing switching regulator pulses;

means for varying the width of said switching regulator pulses operating at said third rate to regulate the output voltage in accordance with a composite voltage derived from simultaneously sensing the switching regulator output voltage and inverter current to improve regulation;

means for storing for substantially a single pulse period said digital samples; and

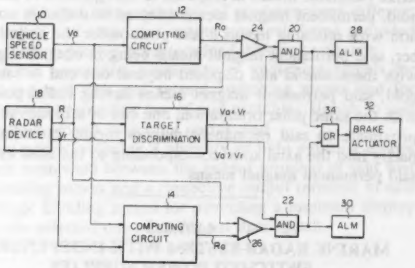
means for reading out of said samples from said storing means at a fourth rate which is constant with each range, said fourth rate being less than or equal to said second rate which latter rate varies in accordance with the radar range setting.

4,097,864

RADAR-OPERATED VEHICLE SAFETY APPARATUS

Hiroshi Endo, Yokosuka, and Kazuhiro Ban, Amagasaki, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Apr. 12, 1977, Ser. No. 786,828
Claims priority, application Japan, Apr. 12, 1976, 51-40381
Int. Cl.² G01S *9/42*
U.S. Cl. 343—7 VM **6 Claims**



1. A vehicle safety apparatus comprising:

a radar device for measuring the range of an object and the speed of the vehicle relative to said object;

a vehicle speed sensor for measuring the speed of the vehicle relative to the roadway;

means for determining whether said object is stationary or moving in the same direction as the vehicle;

a first computing circuit for processing the measured vehicle speed relative to the roadway to derive a first minimum distance on the assumption that said object is stationary;

a first comparator for comparing said measure range of said object with said first minimum distance to provide an output when said measured range is equal to or smaller than said first minimum distance;

a first gate circuit for passing said output from said first comparator to a utilization circuit when said object is determined as a stationary object;

a second computing circuit for processing said measured vehicle speeds relative to both the roadway and the object to derive a second minimum distance on the assumption that said object is moving;

a second comparator for comparing said measured range of said object with said second minimum distance to provide an output when said measured range is equal to or smaller than said second minimum distance; and

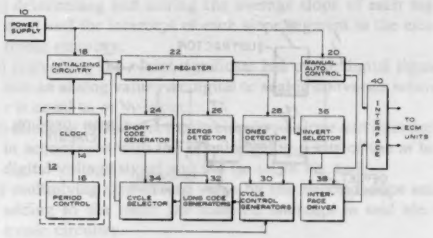
a second gate circuit for passing said output from said second comparator to said utilization circuit when said object is determined as a moving object.

4,097,865

ELECTRONIC COUNTERMEASURE SEQUENCE TIMER

Gerald N. Jones, Inyokern, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 1, 1971, Ser. No. 152,464
Int. Cl.² G01S *7/38*
U.S. Cl. 343—18 E **6 Claims**



1. A random period time sequencer for causing the device to which it is coupled to pseudo-randomly alternate between its operating modes, comprising:

a power supply;

a digital shift register providing a plurality of outputs consisting of ones and zeros in the form of electrical signals;

an initializing circuit coupled to said power supply and having an output coupled to said shift register for providing an electrical signal to said shift register establishing predetermined initial conditions in said shift register;

a variable period clock coupled to said initializing circuit;

a zeros detector coupled to an output of said shift register for detecting the totality of zeros in the output and providing an output indicative thereof;

a ones detector coupled to an output of said shift register for detecting the totality of ones in the output and providing an output indicative thereof;

at least one code generator coupled to an output of said shift register for generating a digital pattern in response to the coincidence of preselected bits therein;

a generator cycle control coupled to said ones and zeros detectors, for receiving their outputs, and to said at least one generator for controlling its pattern cycle;

a cycle selector for selectively coupling said at least one code generator to said shift register; and

an interface driver coupled to the output of said shift register for providing the sequencer output in response thereto.

4,097,866

MULTILEVEL SIDELOBE CANCELLER

William F. Frost, Huntington; Raymond J. Masak; Herbert F. Baurle, both of E. Northport, and Anthony F. Kowalski, Miller Place, all of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 10, 1977, Ser. No. 767,254
Int. Cl.² H04B *1/10*; G01S *3/06*
U.S. Cl. 343—100 LE **2 Claims**

1. A multilevel sidelobe canceller, comprising:

first, second and third antennas, said second and third antennas having substantially omni-directional reception characteristics;

first, second and third adaptive control loops, each of said loops having a signal input, an output and a feedback input;

first and second summers, the output of said first summer forming the output of said multilevel sidelobe canceller;

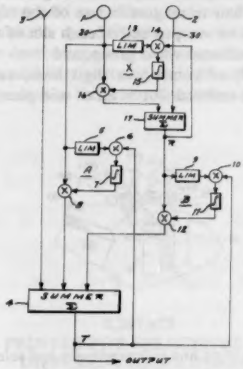
means for coupling said first antenna to a first input of said first summer;

means for coupling said second antenna to the signal inputs of said first and second control loops;

means for coupling said third antenna to one input of said second summer;

means for coupling the output of said second control loop to another input of said second summer;

means for coupling the output of said second summer jointly to the signal input of said third control loop and to the feedback input of said second control loop;



means for coupling the output of said first control loop to a second input of said first summer;

means for coupling the output of said third control loop to a third input of said first summer; and

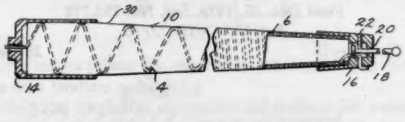
means for jointly coupling the output of said first summer to the feedback inputs of said first and third control loops.

4,097,867

HELICAL ANTENNA ENCASED IN FIBERGLASS BODY

James Joseph Eroncig, 6400 SW. 145th Ter., Miami, Fla.

Filed Sep. 23, 1975, Ser. No. 615,917
Int. Cl.[2] H01Q *1/32, 1/36*
U.S. Cl. 343—715 **2 Claims**



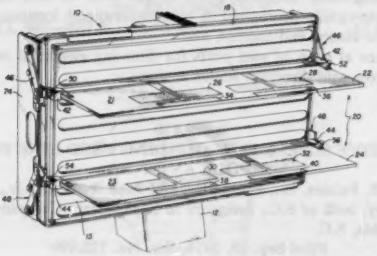
1. A wave guide antenna comprising a hollow fiberglass antenna body encapsulating and totally surrounding a coiled electrically conductive top-loaded wire, said coiled wire being tightly would in helical coils at the top end of said antenna body and increasing in spacing distance between the helical coils as the coils approach the bottom end of said antenna body to provide for interception of ultra short waves, said encapsulated helical wires serving to provide strength to said fiberglass antenna body, a cellophane sheath surrounding and merged into the exterior surface of said fiberglass antenna body, said sheath providing a smooth exterior surface to said antenna, a base ferrule secured to the bottom end of said antenna and electrically connected to the end of wire proximate thereto, a top ferrule secured to the top end of said antenna body and electrically connected to the other end of wire proximate thereto, said top ferrule being provided with a locking mechanism adapted to secure a tuning shaft in an optimum position, said tuning shaft being slideably adjustable along the central axis of said antenna body and being in direct electrical contact with said top ferrule.

4,097,868

ANTENNA FOR COMBINED SURVEILLANCE AND FOLIAGE PENETRATION RADAR

John Joseph Borowick, Bricktown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 6, 1976, Ser. No. 747,764
Int. Cl.[2] H01Q *21/00, 9/28, 19/10*
U.S. Cl. 343—727 **12 Claims**



1. An aperture sharing radar antenna for first and second radar apparatus operative in different frequency bands comprising in combination:

a first radar antenna array including a plurality of waveguides having front and side walls coupled to and operable with said first radar apparatus in one frequency band, the front walls of said waveguides having a plurality of substantially parallel rows of multiple slots arranged along said front walls in a common plane; and

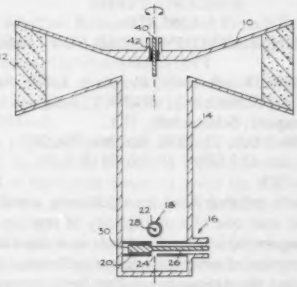
a second radar antenna array coupled to and operable with said second radar apparatus in another frequency band, said second array including a planar dielectric sheet and a stripline dipole element on said sheet operatively mounted transversely to said common plane along the front of said first radar antenna array extending parallel to and spaced from said multiple slots to avoid obstruction thereof and cause negligible interference to the effective operation of said first radar apparatus, said first antenna array acting as a reflector for said second antenna apparatus during operation of said second radar apparatus.

4,097,869

ORTHOGONAL-PORT, BICONICAL-HORN, DIRECTION-FINDER ANTENNA

Lloyd A. Robinson, Mt. View, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Mar. 14, 1977, Ser. No. 777,160
Int. Cl.[2] H01Q *13/00*
U.S. Cl. 343—773 **9 Claims**



1. A direction finder antenna comprising:

a circular waveguide having one end closed and the other

end open, a radiating element comprising a figure of revolution about the axis of said circular waveguide, said radiating element having one wall joined with the open end of the circular waveguide,

an axial opening extending through the wall of the radiating element which is opposite to the wall which joins the circular waveguide wall,

a dipole probe extending through the opening in said wall along the axis of a said circular waveguide,

orthogonally disposed ports in the wall of said circular waveguide positioned at a predetermined location from the closed end thereof, and

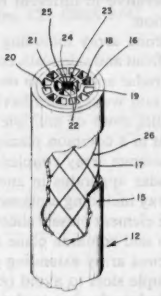
means at each of said ports for deriving electrical outputs from said direction finder antenna.

4,097,870

ACTIVE SLEEVE SURROUNDING FEED LINE FOR DIPOLE ANTENNA

Leon F. Fulmer, Sr., Prosperity, and John R. Lewis, Jr., Newberry, both of S.C., assignors to Shakespeare Company, Columbia, S.C.

Filed Sep. 13, 1976, Ser. No. 722,498
Int. Cl.[2] H01Q *9/16*
U.S. Cl. 343—792 **7 Claims**



1. Apparatus forming at least a portion of an antenna comprising: an outer generally cylindrical casing, rigid one-piece spacer means within said casing having a generally cylindrical outer surface and a honeycomb-like interior including a medial cylindrical member and a plurality of centering lug means extending radially inward from said cylindrical member and together defining an axial aperture spaced from said outer surface, a transmission line positionable in said aperture and centered within said lug means, and a wire braided around the outer surface of said spacer means and uniformly spaced from said transmission line.

4,097,871

TRANSVERSE RECORDING HEAD FOR MAGNETIC PRINTING

Ami E. Berkowitz, Schenectady; Joseph A. Lahut, Scotia, and Jish Min Wang, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

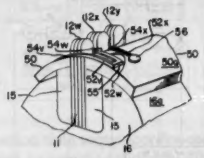
Filed Dec. 27, 1976, Ser. No. 754,582
Int. Cl.[2] G03G *19/00*; G11B *5/20*
U.S. Cl. 346—74.1 **12 Claims**

1. A magnetic printing head for selectively simultaneously magnetizing at least one of a multiplicity of regions of a relatively thin magnetizable recording belt in a direction transverse to a direction of essentially linear movement of the recording belt past the stationary printing head, comprising:

an elongated member of magnetizable material and having a multiplicity (N×M) of linearly arrayed slots formed into an edge thereof closest to the moving magnetic belt, said multiplicity of slots being divided into a plurality (N) of sequential word groups each containing a like number (M) of ordered slots;

a plurality (N) of conductive word lines, each arranged within the plurality of ordered slots of a different one of a plurality of word groups of slots, each word line independently and selectively energizable for carrying an electrical current of magnitude less than the magnitude of current required to selectively form a magnetic field of magnitude sufficient to magnetize one of the regions of said belt adjacent to an open end of each slot of said plurality of slots in each said word group; and

a plurality (M) of conductive digit lines, each arranged within a like ordered slot of all of said plurality of word



groups, each digit line independently and selectively energizable for carrying another electrical current of magnitude less than the magnitude of current required to selectively form a magnetic field of magnitude sufficient to magnetize one of the regions of said belt adjacent to the open end of each slot containing that digit line;

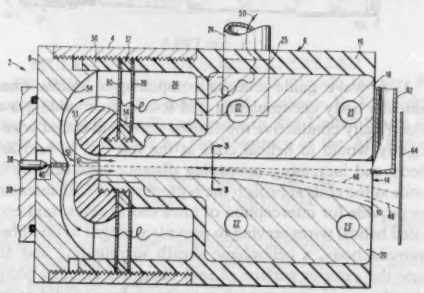
at least one word line and at least one digit line being independently and simultaneously energized to cause formation of a magnetic field of direction essentially transverse to the direction of linear motion of the belt and of magnitude sufficient to magnetize each region of said belt adjacent to those of said slots containing the simultaneously energized lines.

4,097,872

AXIAL DROPLET ASPIRATOR

Francis Peter Giordano, Brooklyn, and Ferdinand Hendriks, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,778
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **25 Claims**



1. An integral ink jet aspirator comprising:

housing means having front and rear ends and including a gas inlet port;

a charge electrode enclosing the front end of said housing means, said electrode having an axial passage from an outer face to an inner face, said inner face being curvilinear;

an ink jet head on said outer face of said charge electrode in

axial alignment with said axial passage in said charge electrode;

a tunnel within said housing means in axial alignment with said axial passage in said charge electrode, said tunnel having an entrance and an exit and having a substantially uniform cross-sectional area from said entrance to said exit;

a mouth at said tunnel entrance having a curvilinear surface spaced from said curvilinear surface of said charge electrode, with the space therebetween forming a channel;

turbulence decreasing means within said housing means and between said inlet port and said channel; and

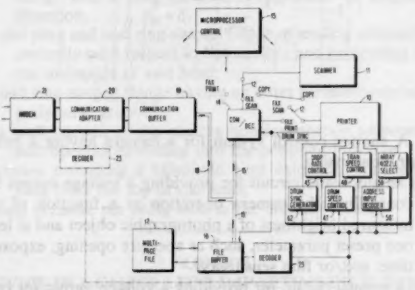
deflection means in the walls of said tunnel.

4,097,873

INK JET PRINTER FOR SELECTIVELY PRINTING DIFFERENT RESOLUTIONS

Van Clifton Martin, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1977, Ser. No. 773,107
Int. Cl.[2] G01D *15/18, 15/24*
U.S. Cl. 346—75 **19 Claims**



1. An ink jet printer for selectively printing different resolutions on a medium comprising:

cylindrical means for supporting the medium for receiving ink drops;

a plurality of arrays of ink jet nozzles disposed relative to said cylindrical means, each of said arrays having a plurality of ink jet nozzles linearly spaced in a first direction to supply ink drops at a selected drop rate to the medium, said arrays being disposed relative to each other so that the tracks from each of said nozzles interlace with other tracks from other of said nozzles;

first producing means to produce relative linear motion between said cylindrical means and said arrays in the first direction;

second producing means to produce relative rotation between said cylindrical means and said arrays in a second direction substantially orthogonal to the first direction;

means to select at least one of said nozzles in at least one of said arrays in accordance with the resolution to be printed;

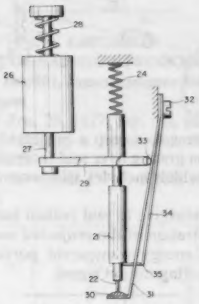
and means to alter at least two out of the velocity of said first producing means, the velocity of said second producing means, and the drop rate of the drops supplied in accordance with the desired resolution to be printed.

4,097,874

BLOCKING ASSEMBLY FOR AN AUTOMATIC DRAFTING DEVICE

Gerold Anderka, Ellerbek; Horst Hampel, Bonningstedt; Walter Jozat, Bad Bramstedt, and Klaus Straszewski, Quickborn, all of Germany, assignors to Mesne Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Continuation-in-part of Ser. No. 781,394, Mar. 25, 1977. This application May 3, 1977, Ser. No. 793,447
Claims priority, application Germany, Feb. 19, 1977, 2707258
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—140 R **17 Claims**



1. In an automatic drafting device of the type adjustably supporting a tubular writing pen with writing tip in both a lowered writing position with the pen tip contacting the writing surface and a raised rest position with the pen tip out of contact with the writing surface, the improvement comprising:

A. A housing support for said tubular pen;

B. A rest mode mechanism mounted upon said housing and engaging said pen, so as to urge said pen inwardly of said housing into a raised rest position;

C. A writing mode mechanism mounted upon said housing and engaging said pen, so as to urge said pen outwardly of said housing in a lowered writing position; and

D. A sealing element supported upon said housing, so as to engage the writing tip of said pen in the raised rest position and so as to disengage laterally from the writing tip in a lowered writing position, and

E. A reciprocable blocking assembly supported in said housing and engaging said sealing element as an override to prevent axial movement of said tubular pen, such that said sealing element is moved laterally outwardly of said tubular pen during pre-selected periods.

4,097,875

SHAFT ENCODER

Frank L. Scholten, Katonah, N.Y., and Francis S. Szabo, Mountain Lakes, N.J., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Apr. 4, 1977, Ser. No. 784,553
Int. Cl.[2] G03B *15/24;* G01D *5/34*
U.S. Cl. 354—8 **3 Claims**

1. In a photocomposition machine wherein characters are projected from a font source to a photosensitive surface, the provision of improved means to space the characters in a line of composition according to the width value of each character, comprising:

a projection system with a focused optical axis;

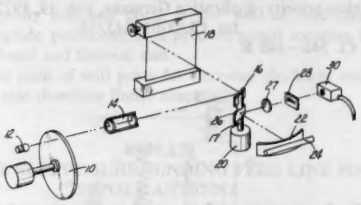
a first beam deflecting means positioned on said optical axis, for intercepting the focused optical axis and directing it to the photosensitive surface;

means for oscillating said first beam deflecting means through an angle sufficient to project the optical axis in measured steps along a length of composition line;

a projection grating of alternate energy transparent and opaque portions, and means to project radiant energy through the energy transparent portions of the projection grating;

a second beam deflecting means carried in oscillation synchronism with said first beam deflecting means;

a receptor grating of alternate energy transparent and opaque portions, and means including said second beam



deflecting means to sweep a projected energy image of said projection grating over said receptor grating along an optical path which includes said second beam deflecting means; and

a sensor means sensitive to said radiant energy positioned to detect a registration of the projected energy pattern with the receptor energy transparent portions to provide a position indicating output signal.

4,097,876

DUAL-MODE LIGHT METER SYSTEM FOR SLR CAMERA USING BEAM-SPLITTING REFLEX MIRROR

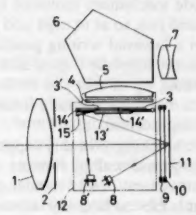
Naoyuki Uno, Urawa, and Katsuhiko Miyata, Tsurugashima, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1976, Ser. No. 748,358

Claims priority, application Japan, Dec. 9, 1975, 50-146675

Int. Cl.[2] G03B *7/08, 19/12*

U.S. Cl. 354—31 **1 Claim**



1. In a single lens reflex camera including a main reflecting mirror movable between raised and lowered positions within a camera box, a viewfinder optical system disposed to receive light reflected from the lowered mirror, reflecting means disposed at the rear of the box closely adjacent to and in front of film means and a light sensing element disposed within the box to implement an automatic exposure time control function in response to light reflected back from the reflecting means and/or the film means after the mirror is raised, the improvement characterized by having at least a portion of the reflecting mirror being formed as a beam splitter whereby some light passes through the lowered mirror and is reflected back onto the sensing element by said reflecting means to implement an initial exposure time display function, said reflecting means including a shield member mounted within the box and movable between a light reflecting position in front of said film means when the mirror is lowered and a light blocking position beneath the mirror when the latter is raised so that the shield member prevents light from entering the camera box via the viewfinder optical system when the mirror is raised, said shield member being mounted to lie at an inclined angle to the film means when in its light reflecting position to implement a uniform light distribution sensitivity for the exposure time display function, a further light sensing element disposed within the box and a further reflecting mirror movable to a position proximate that of the main reflecting mirror when the latter is raised, said further reflecting mirror being operable to direct light reflected back from the reflecting means and/or the film means onto the further light sensing element whereby the combined outputs of the two light sensing elements implement a uniform light distribution sensitivity for the exposure time control function.

4,097,877

DUAL-FUNCTION VARIABLE RESISTOR IN AUTOMATIC/MANUAL CAMERA SHUTTER CONTROL CIRCUIT

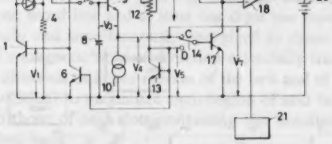
Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1976, Ser. No. 740,326

Claims priority, application Japan, Nov. 11, 1975, 50-153233[U]

Int. Cl.[2] G03B *7/08, 7/00*

U.S. Cl. 354—50 **1 Claim**



1. A shutter control system for a camera having a reflex mirror, comprising:

(a) an automatic circuit for providing a voltage output for controlling the camera operation as a function of the measured brightness of a photographic object and at least one preset parameter, such as aperture opening, exposure time, and/or film sensitivity,

(b) a manual circuit for providing a voltage output for controlling the camera shutter speed in accordance with a preset value thereof,

(c) a variable resistor having a first sliding contact for setting said at least one preset parameter in an automatic mode and a second sliding contact for setting the shutter speed in a manual mode,

(d) first switch means normally connecting said variable resistor and said first sliding contact exclusively in said automatic circuit and responsive to movement of said reflex mirror for connecting said variable resistor and said second sliding contact exclusively in said manual circuit,

(e) a shutter control circuit responsive to a voltage connected to an input thereof for controlling the shutter open duration,

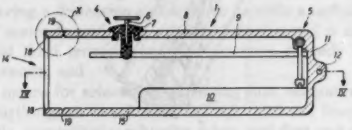
(f) a second switch, manually controllable, for selectively connecting the voltage outputs of said automatic and manual circuits to the input of said shutter control circuit, thereby providing manual selection of automatic and manual modes of operation, and

(g) indicator means connected to the output of said automatic circuit for displaying the parameter calculated by said automatic circuit, whereby said last mentioned parameter is displayed prior to a photography operation irrespective of the position of said second switch.

4,097,878
UNDERWATER HOUSING FOR PHOTOGRAPHIC CAMERAS

Alfons Cramer, Schutzenhausstrasse 13, Oetwil am See, Switzerland

Filed Jan. 6, 1977, Ser. No. 757,176
Claims priority, application Switzerland, Feb. 6, 1976, 1481/76
Int. Cl.[2] G03B *17/08*
U.S. Cl. 354—64 27 Claims

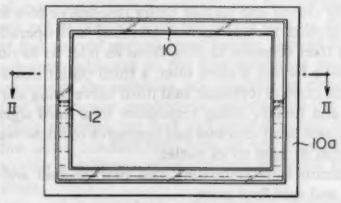


1. An underwater housing for a photographic camera, comprising:
a camera housing portion;
a closure portion detachably connected with the camera housing portion;
said camera housing portion having wall means;
actuation elements for operating the camera penetrating through the wall means of the camera housing portion;
one of the actuation elements comprising a presser arrangement for triggering a camera shutter;
said presser arrangement comprising a pressure pin and a seal formed of elastomeric material;
said camera housing portion having an opening receiving said seal;
said seal comprising a head, a substantially ring-shaped flange and a plug elastically expansible in lengthwise direction;
said plug and said ring-shaped flange extending substantially centrally with respect to one another and protruding from the underside of said head;
said ring-shaped flange having an outer surface containing a peripheral groove;
a wall portion of the camera housing portion surrounding said opening extending into the peripheral groove;
means providing a blindhole bore extending through the plug from the top of the head;
said pressure pin being held in the blindhole bore.

4,097,879
DEVICE IN A CAMERA FOR IMPARTING PICTURES ON A PHOTOGRAPHIC FILM WITH A TOP-AND-BOTTOM INDICATION

Toshihiro Kondo, Chofu, Japan, assignor to Fuji Photo Film Co., Ltd., Minamiashigara, Japan, a part interest

Filed Sep. 28, 1976, Ser. No. 727,423
Claims priority, application Japan, Oct. 17, 1975, 50-125177
Int. Cl.[2] G03B *17/24*
U.S. Cl. 354—106 13 Claims

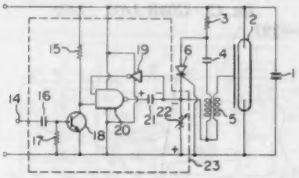


1. In a device for recording marks on a film indicating the top and bottom of picture images on a photographic film in a camera at the time the respective frames of the film are exposed, the combination of, a container having a pair of transparent walls spaced from each other and parallel to the general plane of a film frame positioned to record a photographic image in the camera, said walls defining an open cavity therebetween, said cavity being so positioned that light passing through said transparent walls strikes said photographic film in or adjacent the periphery of said frame, and a body of opaque liquid within said cavity and having a volume of the order of not greater than one-half the volume of said cavity whereby the liquid prevents the passage of light through the lower portion of said cavity while light passes through at least the upper half of said cavity to thereby produce a distinctive marking in or adjacent the periphery of each picture image on the photographic film.

4,097,880
PHOTOGRAPHIC STROBOSCOPE

Tsunemi Yoshino, Ibaraki, Japan, assignor to West Electric Co., Ltd., Osaka, Japan

Filed Jun. 23, 1977, Ser. No. 809,091
Claims priority, application Japan, Jun. 30, 1976, 51-78322; Jul. 2, 1976, 51-79238
Int. Cl.[2] G03B *15/03;* H05B *41/18*
U.S. Cl. 354—145 6 Claims



1. A photographic stroboscope comprising
(a) a main capacitor;
(b) a flash lamp for converting the energy stored on said main capacitor into a flash of light;
(c) a trigger circuit comprising a trigger capacitor, a trigger transformer and a thyristor;
(d) first switching means adapted to be caused to conduct in response to a flash command signal applied thereto;
(e) second switching means responsive to the conduction of said first switching means for reversing its output level and for reversing its output level again to an initial level after said first switching means has been disabled; and
(f) a time delay circuit interconnected between the gate of said thyristor and the output of said second switching means for reverse biasing said gate of said thyristor with respect to the cathode thereof when said first switching means is enabled and for forward biasing said gate of said thyristor with respect to said cathode thereof when said first switching means is disabled, thereby causing said thyristor to conduct.

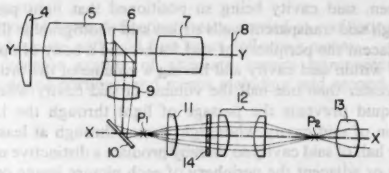
4,097,881
FOCUSSING APPARATUS FOR CAMERAS

Tohru Katagiri, Shimosuwa, Japan, assignor to Sankyo Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Jul. 30, 1976, Ser. No. 710,018
Claims priority, application Japan, Aug. 5, 1975, 50-108407[U]
Int. Cl.[2] G03B *19/12, 13/02*
U.S. Cl. 354—155 8 Claims

1. A focussing apparatus for camera comprising:
a real image rangefinder optical system having an optical axis with primary and secondary image points thereon; and
a mask plate disposed in said optical system of the real image rangefinder between said primary and said secondary

image points, said mask plate having a plurality of apertures symmetrically arranged about and out of intersec-



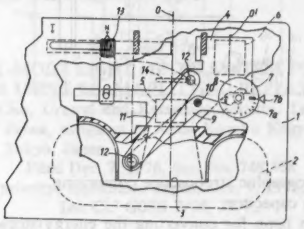
tion with the point of intersection between said mask plate and said optical axis of the optical system.

4,097,882

MULTIPLE LENS CAMERA HAVING LENS-POSITION CONTROLLED FOCAL-LENGTH ADJUSTMENT

Dieter Engelsmann, Unterhaching, Germany, assignor to AGFA-Gevaert AG, Leverkusen, Germany

Filed Dec. 20, 1976, Ser. No. 752,314
Claims priority, application Germany, Dec. 23, 1975, 2558277
Int. Cl.[2] G03B *3/00, 13/02*
U.S. Cl. 354—197 **6 Claims**



1. In a photographic camera having an optical axis, a combination comprising at least two different photographic lenses; a lens carrier mounting said lenses; means mounting said lens carrier for displacement in a direction normal to said axis between respective lens-changing first settings in each of which a different one of said lenses is located on said optical axis, and also for displacement in a direction lengthwise of said axis to different second settings corresponding to different distance ranges; means for selecting respective ones of said second settings; and means responsive to operation of said selecting means for displacing said lens carrier lengthwise of said optical axis through distances which differ for each of said second settings in dependence upon the respective first setting assumed by said lens carrier, including a cam movable by said selecting means, a cam follower tracking said cam, and a transmission element transmitting motion from said cam follower to said lens carrier.

4,097,883

CAMERA GRIP

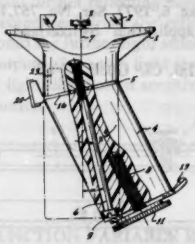
Gunter Adamski, and Claus Prochnow, both of Brunswick, Germany, assignors to Rollei-Werke Franke & Heidecke, Brunswick, Germany

Filed Sep. 9, 1976, Ser. No. 721,891
Claims priority, application Germany, Sep. 17, 1975, 2541384
Int. Cl.[2] G03B *17/56*
U.S. Cl. 354—293 **7 Claims**

1. Grip for photographic and motion picture cameras, comprising:

a head with means for fastening the head to the camera in a particular support surface and having a first, plane interface surface;

a hand grip part having a corresponding plane interface surface, interfacing with the first surface of the head; means for rotatably connecting the hand grip part to the head insert planar interface, there being an axis of rotation



extending transversely to the planar interface between the head and the grip part; and

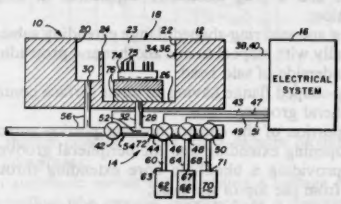
the grip part having a center axis which has an acute, non-zero angle to said axis of rotation.

4,097,884

APPARATUS AND METHOD FOR AUTOMATICALLY PROCESSING X-RAY FILM

Daniel J. Lasky, Santa Clara, and Philip R. Wright, San Jose, both of Calif., assignors to Adex Corporation, Santa Clara, Calif.

Filed Sep. 24, 1976, Ser. No. 726,242
Int. Cl.[2] G03D *3/08*
U.S. Cl. 354—323 **16 Claims**



1. An apparatus for processing x-ray film comprising:

a processing tank having a first port disposed generally in its lower portion, said first port serving to provide an inlet and an outlet for working solutions flowing into or out of said tank;

a first valve having a first inlet, a first outlet and a first electrical control terminal, said first valve being normally closed and further being responsive to a first signal applied to said first terminal and operative to allow a developer solution to flow from its inlet to its outlet;

a second valve having a second inlet, a second outlet and a second electrical control terminal, said second valve being normally closed and further being responsive to a second signal applied to said second terminal and operative to allow a fixer solution to flow from its inlet to its outlet;

a third valve having a third inlet, a third outlet and a third electrical control terminal, said third valve being normally closed and further being responsive to a third signal applied to said third terminal and operative to allow water to flow from its inlet to its outlet;

conduit means interconnecting said first, second and third outlets and said first port;

a fourth valve having a fourth inlet connected to said conduit means, a fourth outlet and a fourth electrical control terminal, said fourth valve being normally closed and further being responsive to a fourth signal applied to said fourth terminal and operative to allow working solutions to flow from its inlet to its outlet;

a first source of photographic developer solution having a first orifice coupled to said first inlet and being capable of supplying developer solution to said first inlet;

a second source of photographic fixer solution having a second orifice coupled to said second inlet and being capable of supplying fixer solution to said second inlet;

a third source of water having a third orifice connected to said third inlet, said water having a pressure which is in a predetermined range between a first pressure and a second pressure and being subject to variations, said third orifice having a dimension sufficient to provide a turbulent flow of water to said tank when said third signal is applied to said third terminal and said pressure exceeds said first pressure; and

first means for selectively supplying first, second, third and fourth signals to said first, second, third and fourth terminals, respectively, whereby when said first and third signals are applied, developer solution and water turbulently flow into said tank via said first and third valves to form a developer working solution, when said second and third signals are applied, fixer solution and water turbulently flow into said tank via said second and third valves to form a fixer working solution when said third signal is applied, water turbulently flows into said tank via said third valve, and when said fourth signal is applied, the liquids filling said tank are permitted to drain through said fourth outlet.

4,097,885

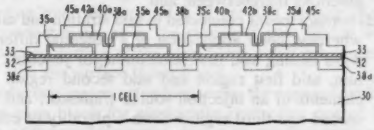
COMPACT, TWO-PHASE CHARGE-COUPLED-DEVICE STRUCTURE UTILIZING MULTIPLE LAYERS OF CONDUCTIVE MATERIAL

Lloyd R. Walsh, San Jose, Calif., assignor to Fairchild Camera and Instrument Corp., Mountain View, Calif.

Filed Oct. 15, 1976, Ser. No. 732,614

Int. Cl.[2] H01L *29/78;* Ho1L *29/04;* G11C *19/28*

U.S. Cl. 357—24 **10 Claims**



1. At least one semiconductor cell structure, a cell thereof comprising:

a substrate formed from selected semiconductor material of one conductivity type;

a region of first insulating material formed on a first surface of the substrate;

a plurality of regions of first electrically conductive material disposed at selected intervals on the first insulating material;

a plurality of regions of second insulating material formed on all portions of first electrically conductive material which are not in contact with the first insulating material;

first and second spaced apart barrier regions formed in the substrate adjacent to the first insulating material and in regions of the substrate not overlaid by either one of the first electrically conductive material and the second insulating material, the first and second barrier regions being the same conductivity type as the substrate, but each having a different impurity concentration than the substrate;

a region of second electrically conductive material disposed on that portion of the first insulating material over alternate barrier regions, and disposed on the second insulating material overlying selected portions of the first electrically conductive material;

a region of third insulating material formed on all portions of second electrically conductive material which are not in contact with either one of the first and the second insulating materials;

a region of third electrically conductive material disposed on that portion of the first insulating material over remaining barrier regions, and disposed on selected portions of the second and the third regions of insulating material;

means for electrically connecting alternating regions of first electrically conductive material to the second electrically conductive material; and

means for connecting the remaining regions of the first electrically conductive material to the third electrically conductive material.

4,097,886

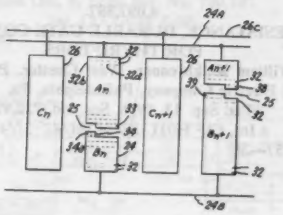
SPLIT ELECTRODE STRUCTURE FOR SEMICONDUCTOR DEVICES

Richard D. Baertsch, Scotia, and Jerome J. Tiemann, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 22, 1976, Ser. No. 735,024

Int. Cl.[2] H01L *29/78;* G11C *19/28;* H03H *7/28*

U.S. Cl. 357—24 **2 Claims**



1. A semiconductor device comprising

a substrate of semiconductor material including an active channel portion of generally rectangular outline having a length and a width dimension located adjacent a major surface thereof,

means for transferring charge carriers along the length of said channel portion, and two potential barriers to the transfer of charge carriers in a direction orthogonal to the length of said channel portion which form two side bounds of said channel portion and thereby define said width dimension of said channel portion,

said means for transferring charge carriers including potentials applied to a group of electrodes insulatingly overlying said channel portion and orthogonal to the length dimension thereof, each of said electrodes being of the same length measured along the length dimension of said channel portion,

said electrodes forming with said substrate a plurality of stages of a semiconductor device, each stage of said device including a respective one of said electrodes, each of said electrodes having the same area over the extent of said channel portion, each of said electrodes having a split along the length dimension thereof dividing the electrode into a first part and a second part, each of the ratios of the area of the first part to the second part of an electrode being set to a respective predetermined value,

the area of each of said parts of said electrodes resolvable into the area of a respective integral number of elements and a remainder portion smaller in area than the area of an element, an element being a rectangle having one side equal to the length of said electrodes and an adjacent side equal to a predetermined minimum linear dimension,

the area of each of said remainder portions resolvable into the area of a respective integral number of subelements, a subelement being a square having a side equal to said predetermined minimum linear dimension,

each pair of remainder portions of an electrode being located

adjacent the split thereof, the sum of the areas of each pair of remainder portions of a respective electrode being fixed and less than or equal to the area of an element,

some of said electrodes including a remainder portion having an area less than the area of an element,

a first-conductive line connected to the first parts of said electrodes,

a second conductive line connected to the second parts of said electrodes,

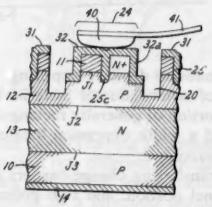
whereby each part of an electrode can be provided with any of PQ consecutive discrete values of area from zero to the total area of an electrode, where P equals the number of elements in an electrode and Q equals the number of subelements in an element.

4,097,887

LOW RESISTANCE, DURABLE GATE CONTACT PAD FOR THYRISTORS

Francis William Kalkbrenner, West Chester, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Sep. 13, 1976, Ser. No. 722,973
Int. Cl.[2] H01L *29/74, 23/42, 23/44*
U.S. Cl. 357—38 **14 Claims**



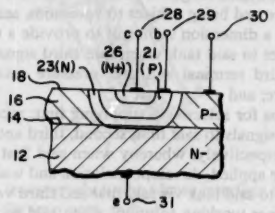
1. A thyristor comprising, a multi-layer body of semiconductor material having opposite end layers and at least one intermediate base layer of alternately opposite P and N conductivity types, one said end layer being slotted to form laterally adjacent main and control regions, said main region and the opposite end layer of said body being metalized on their outer surfaces to form two main electrodes of said body, said one end layer in said control region having a relatively lower impurity concentration contiguous base layer and being apertured to provide at least one channel extending transversely therethrough to said base layer, a body of conductive metal coating said one higher impurity concentration end layer in said control region and filling said channel thereby to form a control electrode contact surface directly electrically connected to said base layer through said channel, said body of conductive metal extending over lateral edges of said control region into electrical contact with said base layer, and a control contacting means pressed against said contact surface and having a contact area appreciably greater than the cross sectional area of said transverse channel wherein the wearing away of said contact surface of metal causes said contacting means to be brought into direct contact with said higher impurity concentration end layer such that substantially all current entering into said end layer under said contact surface is transmitted directly into said base layer through said body of conductive metal without crossing the junction between said higher impurity end layer and said base layer.

4,097,888

HIGH DENSITY COLLECTOR-UP STRUCTURE

Lewis K. Russell, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 622,714, Oct. 15, 1975, abandoned.
This application Feb. 7, 1977, Ser. No. 766,483
Int. Cl.[2] H01L *29/72*
U.S. Cl. 357—46 **11 Claims**



1. A high density semiconductor structure comprising:

(a) a body of semiconductor material including a stratum of first conductivity type having a substantially planar surface;

(b) first and second nested regions disposed within said stratum so as to extend from said planar surface to different depths below the surface of said stratum, said first region being of second conductivity type opposite said first conductivity type and disposed within said stratum so as to form a first semiconductor junction therebetween, said second region being of said first conductivity type and nested within said first region to form a second semiconductor junction therebetween, said first region being substantially uniform in thickness and relatively thin as compared to its depth below the surface of said stratum;

(c) a plurality of third regions of said second conductivity type disposed within said second region in spaced apart relation to form a like plurality of third semiconductor junctions therebetween; and

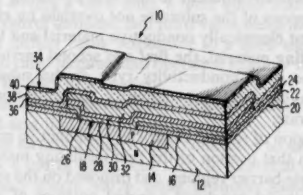
(d) contact means connected to said stratum and said regions whereby, upon application of a potential difference forward biasing said first semiconductor junction, said stratum, said first region and said second region form the elements of an injection source transistor, and said first, second and third regions form a plurality of collector-up transistors.

4,097,889

COMBINATION GLASS/LOW TEMPERATURE DEPOSITED $Si_xN_yH_zO_z$ PASSIVATING OVERCOAT WITH IMPROVED CRACK AND CORROSION RESISTANCE FOR A SEMICONDUCTOR DEVICE

Werner Kern, Belle Mead, and Chester Edwin Tracy, South River, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,850
Int. Cl.[2] H01L *29/34*
U.S. Cl. 357—54 **7 Claims**



1. In a semiconductor device having a metallic conductor disposed on the surface of a body of semiconductor material

and a passivating overcoat including a glass layer disposed over said conductor, the improvement comprising said passivating overcoat further including a low-temperature-deposited nitride layer comprising a chemical compound having the formula $Si_wN_xH_yO_z$, wherein *w*, *x*, *y* and *z* are integers other than zero said nitride layer being deposited at a temperature below the eutectic temperature at which said metallic conductor begins to alloy with said semiconductor material.

4,097,890

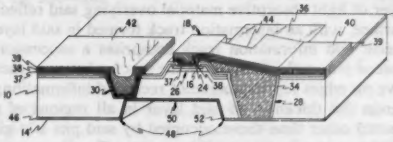
LOW PARASITIC CAPACITANCE AND RESISTANCE BEAMLEAD SEMICONDUCTOR COMPONENT AND METHOD OF MANUFACTURE

Raymond A. Morris, Sunnyvale, and Thomas J. Viola, Jr., Mountain View, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 699,130, Jun. 23, 1976, abandoned. This application Mar. 23, 1977, Ser. No. 780,373

Int. Cl.² H01L *29/06*

U.S. Cl. 357—55 **5 Claims**



1. A low-parasitic capacitance and electrical resistance semiconductor component comprising:

semiconductor means having a substrate with a first and a second surface, a plurality of edges, and a plurality of layers of selected conductivity types for implementing a selected semiconductor device on the first surface adjacent to one of said edges;

a block of a selected glass juxtaposed to the full height and width of said one edge of the semiconductor means and extending over said one edge of the first surface of the semiconductor means to the semiconductor device with the exposed surface of the glass block being substantially flush with the surface thereof; and

first conductive means extending across the exposed surface of the glass block for electrically contacting one of the layers of the semiconductor device on the first surface of the semiconductor means.

4,097,891

LASER STUD MOUNTS

Peter Richard Selway; Martin Chown; Richard Edward Epworth, all of Harlow; Norman Derek Leggett, Hoddesdon, and Harish Ram Dass Sunak, Bishops Stortford, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 25, 1976, Ser. No. 670,323

Claims priority, application United Kingdom, Apr. 1, 1975, 13203/75

Int. Cl.² H01L *23/12*

U.S. Cl. 357—81 **8 Claims**

1. A laser apparatus comprising:

a metallic base;

an externally threaded stem coupled to and extending from one side of said base, said stem having a bore therein along its axis;

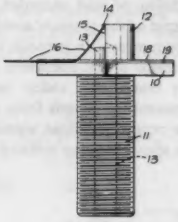
a heat sink coupled to and extending from another side of said base, said bore extending into said heat sink;

an injection laser mounted on said heat sink and having a first terminal provided by said stem, base and heat sink;

a strip line forming a second terminal for said injection laser;

a body of electrically insulating material coupled to said base for securing said strip line; and

a light guide consisting of a core region surrounded by a lower refractive index cladding region extending through



the stem in said bore for receiving radiation from said laser and transmitting said radiation.

4,097,892

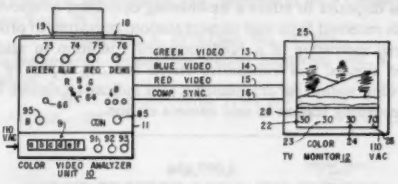
VIDEO COLOR FILM ANALYZER

George H. Balding, 252 West-1300 South, Salt Lake City, Utah 84115

Filed Oct. 8, 1976, Ser. No. 730,737

Int. Cl.² G03F *3/08*

U.S. Cl. 358—80 **25 Claims**



1. In a color film analyzer for processing color films, film scanning means for scanning a film and providing separate color signals representative of each of a plurality of different colors of the film, reference means for deriving reference levels from the color signals provided while a standard film is being scanned, said reference means including register means for registering said reference levels for use in the processing of unknown films thereafter, and control means including adjustable means for adjusting the color signals provided while an unknown film is being scanned to said reference levels.

4,097,893

PORTABLE VIDEO RECORDING SYSTEM EMPLOYING CAMERA AND RECORDING STATIONS CONNECTED BY WIRELESS LINKS

Marvin Camras, Glencoe, Ill., assignor to IIT Research Institute, Chicago, Ill.

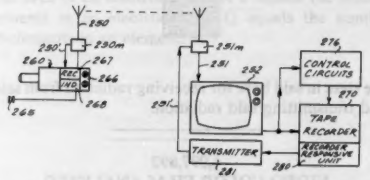
Continuation-in-part of Ser. No. 488,466, Jul. 15, 1974, Pat. No. 3,984,625, which is a continuation of Ser. No. 237,220, Mar. 22, 1972, abandoned, which is a continuation of Ser. No. 889,775, Dec. 11, 1969, abandoned, which is a division of Ser. No. 545,050, Apr. 22, 1966, Pat. No. 3,484,546. This application Aug. 27, 1976, Ser. No. 718,173

Int. Cl.² H04N *7/00*

U.S. Cl. 358—83 **29 Claims**

1. A portable video recording system, particularly for amateur video recording operations and the like, comprising a video recording station, and an independent, self-contained and self-powered portable video camera station, the latter being of a size to be readily manually carried on the person and comprising a video camera, a transmitter operatively connected to said camera, for transmitting the output signals of said video camera by transmission of a high-frequency carrier signal, means for forming recorder start-stop signals, means on the camera for controlling the transmission of recorder start-

stop signals from the transmitter, receiver means forming a part of said camera station, for receiving signals transmitted from such a recording station and representing a predetermined operating condition of said recorder, and indicating means to which the output of the receiver means is supplied for control of said indicating means, to provide a desired indication to the camera operator of the operation of the recorder; said recording station comprising video recording means, means for receiving transmitted signals from said camera station and supplying the received output signals of said video camera, together with synchronizing control signals, to said



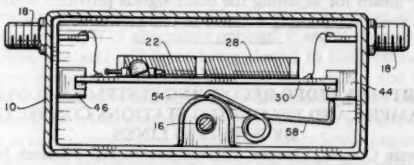
video recording means, means for controlling the start-stop operation of said recording means, means operatively connected to said recorder receiving means and to said recorder-controlling means, responsive to recorder start-stop signals from said camera station received by said receiving means, means disposed to effect a monitoring operation of television signals received from said camera station, operative to provide a signal indicative of a predetermined condition in said received signals, and transmitter means forming a part of said recording station for transmitting said indicative signals from the recording station to said camera station.

4,097,894

SECURED SCRAMBLE DECODER FILTER

James L. Tanner, Reseda; Bruno A. Rist, Northridge; George Sanchez, Los Angeles, and Balazs Becht, Granada Hills, all of Calif., assignors to Tanner Electronics Systems Technology, Inc., Van Nuys, Calif.

Filed Nov. 1, 1976, Ser. No. 737,755
Int. Cl.² H04N *1/44*; H01H *35/42*; H01R *13/44*
U.S. Cl. 358—118 **12 Claims**



1. A circuit device for removing an interfering signal purposely injected between the video carrier and audio carrier of a television transmission signal, said interfering signal having a frequency substantially in the range of one-fourth to three-fourths of the frequency interval between the video carrier and the audio carrier comprising:

a housing;

a narrow band notch filter mounted in said housing;

means for tuning said filter to the optimum frequency for eliminating the interfering signal, the latter having a frequency substantially in the range of one-fourth to three-fourths of the frequency interval between the video carrier and the audio carrier; and

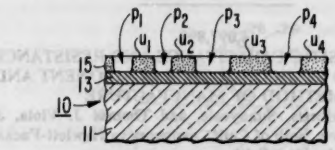
means for mounting said housing, said mounting means including means for securing said filter against unauthorized removal from said mounting.

4,097,895

MULTILAYER OPTICAL RECORD

Fred William Spong, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,495
Int. Cl.² H04N *5/76*; G11B *7/24*; G01D *15/34*
U.S. Cl. 358—128 **5 Claims**



1. An information record, for use in playback apparatus employing a playback beam of light of a given frequency; said record comprising:

a substrate having a light reflective surface; and

a layer of light absorptive material overlying said reflective surface, with an information track formed in said layer;

wherein said information track comprises a succession of spaced pits, with variations in the spacing between successive pit edges representative of recorded information;

wherein the thickness of said layer in all regions of said record other than those occupied by said pits is a given thickness chosen to establish an anti-reflection condition for all said other record regions for light at said given frequency directed toward said light reflective surface through said absorptive layer; and

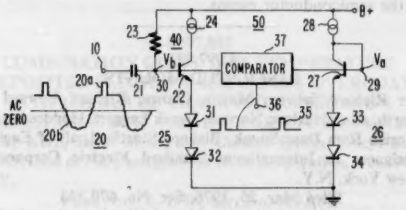
wherein the thickness of said layer in those record regions occupied by said pits is significantly less than said given thickness.

4,097,896

SYNC SEPARATOR CIRCUIT

Leslie Ronald Avery, Surrey, England, assignor to RCA Corporation, New York, N.Y.

Filed Mar. 3, 1977, Ser. No. 774,213
Claims priority, application United Kingdom, Feb. 23, 1977, 12535/77
Int. Cl.² H04N *5/08*
U.S. Cl. 358—153 **18 Claims**



1. A sync separator circuit, comprising:

a source of video signals, said video signals including synchronizing signals;

a first plurality of series coupled diodes;

controllable switching means coupled to said first plurality;

a source of first bias current coupled to a control terminal of said controllable switching means;

first means coupled to one of said first plurality and said controllable switching means for providing a first current through said first plurality of series coupled diodes, said first current establishing a first voltage at a first terminal coupled to said first plurality of series coupled diodes during the occurrence of said synchronizing signals;

second means coupled to said control terminal and respon-

sive to said source of video signals for providing during the occurrence of said synchronizing signals an additional bias current to said controllable switching means for introducing to said first plurality of series coupled diodes during said occurrence a second current in addition to said first current for establishing a second voltage at said first terminal;

a source of first reference voltage; and

comparator means responsive to said first reference voltage and said second voltage for developing an output signal when said second voltage and said first reference voltage differ by a predetermined value.

4,097,897

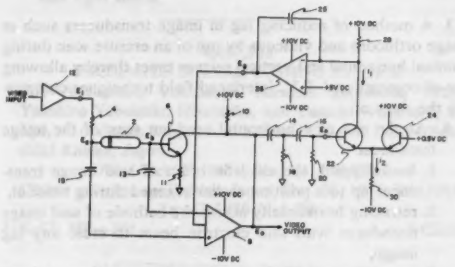
AUTOMATIC BOOST CONTROL IN AN APERTURE CORRECTOR FOR TV VIDEO SIGNALS

Edwin Earl Morris, Clinton, N.Y., assignor to General Electric Company, Utica, N.Y.

Filed Apr. 22, 1977, Ser. No. 790,161

Int. Cl.[2] H04N *5/14, 5/22*

U.S. Cl. 358—162 **4 Claims**



1. An automatic boost control of an aperture correction circuit for a video signal in a television camera comprising:

an input connection adapted to receive the video signal;

a first resistor having its first end connected to said input connection;

a delay line having an input and an output terminal with said input terminal connected to the second end of said first resistor;

a differential video amplifier connected to each end of said delay line to provide an output boost signal;

a second video amplifier connected to said output terminal of said delay line to amplify said video signal;

a high pass filter connected in circuit with the output of said second video amplfier to extract high frequency noise from the video signal; and

detecting means connected in circuit with said high pass filter for detecting an RMS value signal of said high frequency noise, the output of said RMS detector being connected to said differential video amplifier in order to control the gain of said amplifier, thereby controlling the amount of boost.

4,097,898

METHOD AND APPARATUS FOR LINEARLY FILTERING TWO-DIMENSIONAL SIGNALS

Ronald Jan Geluk, Nootdorp, Netherlands, assignor to N. V. Optische Industrie "De Oude Delft", Delft, Netherlands

Filed Dec. 30, 1976, Ser. No. 755,790

Claims priority, application Netherlands, Jan. 8, 1976, 7600155

Int. Cl.[2] H04N *5/21, 5/72*

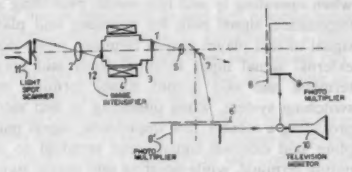
U.S. Cl. 358—163 **7 Claims**

1. A method of linearly filtering spatially a two-dimensional image comprising

applying the two-dimensional image to an electronic image scanning system to generate a scanned image;

dividing the scanned image into two scanned image portions;

filtering the separate scanning image portions by two masks, respectively, one mask including the positive part of a desired filter function and the other mask including the negative part of a desired filter function;



detecting the light passed through the masks by respective photodetectors to generate respective output signals;

substracting one of the output signals from the other output signal to thereby generate a filtered signal; and

reproducing the filtered signal into a filtered two-dimensional image.

4,097,899

VIDEO RECORD PLAYER SWITCHING SYSTEM

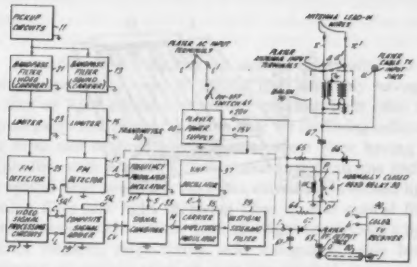
John Pang Yu, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,866

Claims priority, application United Kingdom, Dec. 8, 1975, 50280/75

Int. Cl.[2] H04N *5/22, 7/00, 5/78, 5/44*

U.S. Cl. 358—181 **18 Claims**



1. In a video record player, including means for recovering recorded signals respectively representative of picture information and accompanying sound information; apparatus comprising, in combination:

an external signal input terminal;

a player output terminal;

a player on/off switch, subject to switching between "on" and "off" conditions;

a power supply developing a plurality of supply potentials in response to switching of said player on/off switch to said "on" condition;

means, rendered operative in response to supply potential development by said power supply, for forming a player output signal inclusive of picture carrier frequency oscillations and sound carrier frequency oscillations;

said player output signal forming means having a picture signal input terminal coupled to said recorded signal recovering means and a sound signal input terminal coupled to said recorded signal recovering means, and including means for modulating the amplitude of said picture carrier frequency oscillations in accordance with recovered picture signal information when present at said picture signal input terminal, and means for modulating the frequency of said sound carrier frequency oscillations in accordance with recovered sound

signal information when present at said sound signal input terminal; and

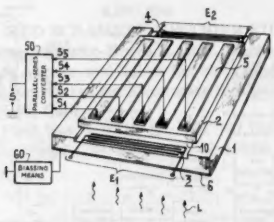
a switching system coupled to said power supply, and subject to operation in a first mode in response to development of one of said supply potentials, while subject to operation in a second mode in the absence of said one supply potential development; said switching system, when operating in said first mode, providing a first, low impedance, signal path for coupling said player output signal to said player output terminal, while isolating said external signal input terminal from said player output terminal and said output signal forming means; said switching system, when operating in said second mode, providing a second, low impedance, signal path for coupling said external signal input terminal to said player output terminal, while isolating said output signal forming means from said player output terminal and said external signal input terminal.

4,097,900

ELECTRO-ACOUSTIC DEVICE FOR READING A TWO DIMENSIONAL IMAGE BY MEANS OF AN ELECTRODE NETWORK

Michel Moulin, and Bernard Munier, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 17, 1976, Ser. No. 751,942
Claims priority, application France, Dec. 23, 1975, 75 39526
Int. Cl.[2] H04N *5/30*
U.S. Cl. 358—213 **10 Claims**



1. An electro-acoustic device for reading an optical image in two dimensions, comprising:

a semiconductive and photosensitive medium onto which said image is projected on a interaction surface;

a piezoelectric medium coupled with said semiconductive medium and carrying at least two electromechanical transducers on its surface, said transducers generating two elastic surface waves in opposite directions under electrical control, one of said waves being in the form of a pulse and the other in the form of a long wave of which the duration is at least equal to twice the time taken by said pulse to scan said interaction surface, the scanning of said interaction surface by said pulse producing, by means of non-linear interaction with said long wave, an electrical signal of which the amplitude at each point is dependent upon the illumination at that point;

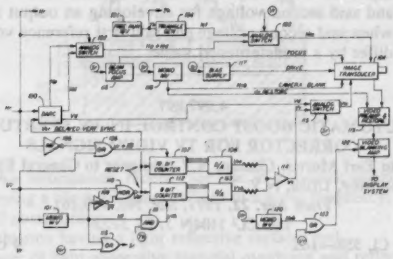
an electrode network carried by said semiconductor medium, said electrodes being in ohmic contact with said semiconductor medium and electrically insulated from one another and being substantially parallel to the propagation direction of the elastic waves, the electrical signals collected respectively by each of said electrodes together representing the line-by-line analysis of said image, each electrode constituting an analysis line.

4,097,901

LAG REDUCTION IN IMAGE TRANSDUCERS HAVING DYNAMICALLY SHAPED RASTERS

David L. Peters, Whitney Point, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Apr. 12, 1977, Ser. No. 786,838
Int. Cl.[2] H04N *5/34*
U.S. Cl. 358—223 **6 Claims**



1. A method of reducing lag in image transducers such as image orthicons and vidicons by use of an erasure scan during nominal horizontal and vertical retrace times thereby allowing use of conventional T.V. interlaced field techniques comprising the steps of:

A. At the end of a horizontal read-out scan of the image transducer

1. backstepping the electron beam of said image transducer up to a position earlier scanned during readout,
2. retracing horizontally across the cathode of said image transducer with said electron beam to erase any lag image,
3. repositioning said electron beam to begin the next horizontal read-out scan,
4. initiating said next horizontal read-out scan, and
5. repeating steps **A1** through **A4** until the last horizontal scan line in a given reaster field has been scanned, then

B. When the last horizontal line in the field has been scanned

1. back-stepping the electron beam up to the region last erasure-scanned by said beam,
2. performing multiple erasure scans so as to completely erase the remaining surface of said cathode within the time normally available for vertical retrace in conventional T.V. systems,
3. repositioning said electron beam to begin the first horizontal read-out scan,
4. initiating said next raster field scan, and
5. repeating steps A and b.

4,097,902

TELEVISION LIGHT SHIELD

Roy F. Curnuck, 243 Elm Dr., Levittown, N.Y. 74226

Filed Mar. 15, 1977, Ser. No. 777,629
Int. Cl.[2] H01J *24/06*; H04N *5/64*
U.S. Cl. 358—255 **5 Claims**

1. A detachable and adjustable television light shield for providing a generally enhanced picture comprising

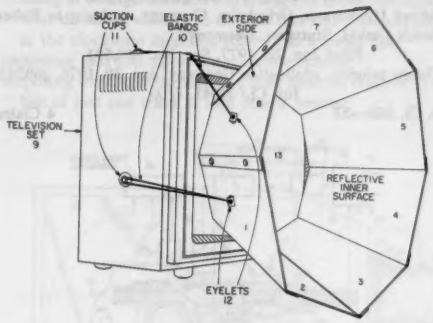
a series of eight plates that are attachable in an octagonal fashion to provide said light shield

wherein said series of eight plates are formed from two sets of four plates each,

said sets of plates differ from each other by 1 inch in width

said plates consist of a reflective inner surface and a non-reflective outer surface, wherein the reflective inner surface is positioned to receive and reflect the images from the television faceplate

mounted on said plates are eyelets, which are attachable to suction cups by elastic bands,



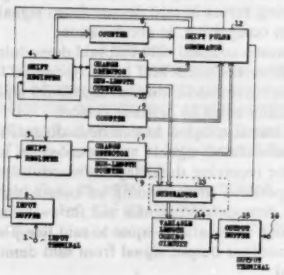
said suction cups are strategically placed on the cabinet of the television set, thereby providing adequate support for said light shield.

4,097,903

FACSIMILE SIGNAL CODING SYSTEM

Yukio Nakagome, Yokohama; Hiroichi Teramura, Tokyo; Yasuhiro Yamazaki, Hiratsuka, and Yasushi Wakahara, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Oct. 29, 1976, Ser. No. 736,738
Claims priority, application Japan, Oct. 30, 1975, 50-130841
Int. Cl.[2] H04N *1/00*
U.S. Cl. 358—261 **8 Claims**



1. A facsimile signal coding system comprising:

input terminal means for receiving a facsimile signal obtained by scanning an original picture;

storage means connected to said input terminal means for successively and temporarily storing the lengths and positions on each scanning line of runs of black or white signal;

first register means connected to said storage means for shifting the runs of black and white on a scanning line to be coded;

second register means connected to said storage means for shifting the runs of black and white on a reference scanning line preceding said scanning line to be coded;

first counter means connected to said first register means for determining the length and position of an instant run to be coded on said scanning line to be coded;

second counter means connected to said second register means for determining, as reference run information, the length and position of a reference run on said reference scanning line, wherein said reference run is defined as the run including the reference picture element just above the first occurring picture element of the instant run to be coded when said first occurring picture element and said reference picture element just above said first occurring picture element have the same state, and said reference run is defined as the run succeeding the run including the reference picture element just above the first occurring picture element of the instant run to be coded when said first occurring picture element and said reference picture element just above said first occurring picture element have different states;

subtractor means connected to said first counter means and said second counter means for determining a difference between respective run lengths of said instant run to be coded and said reference run and for developing an error signal representative of the difference;

coding means connected to said subtractor means for coding said error signal to develop a coded output pulse train; and

output terminal means connected to said coding means for sending out said coded output pulse train.

4,097,904

OPTICAL READ HEAD

Tasaku Wada, Narita, Japan, assignor to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed May 5, 1977, Ser. No. 794,315
Claims priority, application Japan, May 15, 1976, 51-54814
Int. Cl.[2] H04N *1/12;* **G02B** *5/16*
U.S. Cl. 358—294 **3 Claims**

1. A read-head for reading an optical information on an original paper comprising an optical fiber assembly having a plurality of light emission fibers for emitting light onto the original paper and a light receiving fiber for receiving reflected light from said original paper, a transparent plate having an opaque film with a small hole mounted at the extreme end of said optical fiber assembly, the other extreme end of said light emission fiber and light receiving fiber in said optical fiber assemble being positioned in front of a light source and a light detector element, respectively, said transparent plate being positioned in contact with or near the original paper to be scanned.

4,097,905

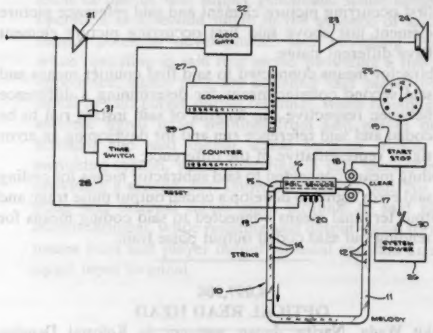
TAPE PLAYER TIME SIGNAL

Justin Kramer, 1028 W. 8th Pl., Los Angeles, Calif. 90017

Filed Sep. 2, 1976, Ser. No. 719,931
Int. Cl.[2] G11B *5/00, 15/18, 15/48*
U.S. Cl. 360—12 **11 Claims**

1. A musical tape play system for the reproduction of bell tones comprising a sound tape length having electronically reproduced thereon individual recordings of bell tones and a starter length of tape preceeding said recordings clear of recordings, an electric circuit including respectively a tape head, audio gate means, an amplifier and loud speaker combination, a clock mechanism, electric powered tape travel means, timing means and accompanying pre-amplifier means all electrically connected in said circuit, said timing means and accompanying pre-amplifier means being responsive to said starter length of tape and adapted to open said audio gate means to the speaker, said timing means including reset means responsive to pulse recordings on the tape to reset the timing means, counter and comparator means electrically connected in the circuit responsive jointly to said clock mechanism and said timing means

whereby reproduction of one or more of said individual pulse recordings will be effected thereby and the remainder of said individual pulse recordings will be silenced, and stop means in said circuit spaced from the individual pulse recordings and



electrically connected to the tape travel means acting after reproduction of the last of said individual pulse recordings to stop action of said tape travel means after a decay interval has passed.

4,097,906

INTER-RECORD GAP RECORDING OR PLAYBACK APPARATUS

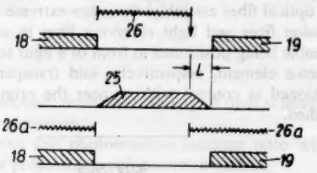
Josef Schild, Vienna; Robert Scheiber, Wiener Neudorf; Harald Schmidt, Vienna; Josef Drasch, Vienna, and Eduard Keznickl, Vienna, all of Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Apr. 9, 1976, Ser. No. 675,583

Claims priority, application Austria, Apr. 10, 1975, 2746/75; Jul. 25, 1975, 5795/75

Int. Cl.² G11B *27/08*

U.S. Cl. 360—13 **18 Claims**



1. A recording apparatus for a tape-like data medium in which a sound sequence is recorded in gaps between sections of the data medium carrying an original sound recording without removal of the original recording, said apparatus comprising a record head, an erase head, data medium transport means for selectively driving the data medium in a forward or a reverse direction, mode setting means for the setting of the operating mode of the apparatus in either a record mode or a playback mode, and at least one counting means for actuating the mode setting means after a preset data medium length has run through wherein said counting means comprises means for producing a signal for switching on at least one fading device means at a predetermined data medium length prior to the end of one of said gaps between sections of the data medium carrying said original sound recording, said fading device means for selectively fading-in or fading-out a portion of said sound sequence in said one of said gaps between sections of the data medium carrying an original sound recording.

4,097,907

METHOD AND APPARATUS FOR THE SUPPRESSION OF SWITCHING DISTURBANCES

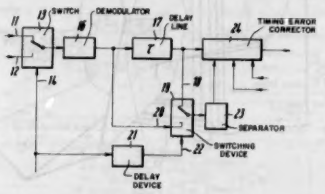
Winfried Horstmann, Griesheim, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 28, 1977, Ser. No. 763,591

Claims priority, application Germany, Jan. 30, 1976, 2603420

Int. Cl.² H04L *7/00*

U.S. Cl. 360—33 **4 Claims**



1. A system for suppressing signal disturbances, which are due to switching from a first television signal to a second television signal, for use during a playback of said television signals on a magnetic tape recorder including a magnetic tape having image structure and synchronous signals recorded thereon in line packets, each line having about the same associated line period of time, and for use in connection with an electronic switch including input means coupled to said television signals and output means and being operative to be energized by a switching signal for disconnecting said first television signal and connecting said second television signal to the output means, a demodulator coupled to the output means of said switch and being operative for producing demodulated signals from said television signals, and a timing error corrector operative for receiving said demodulated signals and for reducing timing errors in said demodulated signals,

said system comprising, in combination:

delaying means coupled between said demodulator and said timing error corrector and being operative for receiving and delaying said demodulated signals for a period of time substantially equal to said line period;

switching means coupled to said demodulator for receiving said demodulated signals and coupled to said delaying means for receiving the delayed demodulated signals and being operative for providing an output signal from the delayed demodulated signals and for switching for a period of time substantially equal to said line period for producing another output signal from said demodulated signals; and

amplitude filtering means coupled to said switching means and said timing error corrector for receiving said output signals and being operative for selectively passing synchronous signals forming a portion of said output signals to said timing error corrector.

4,097,908

METHOD FOR INSPECTING THE SKEW OF A MAGNETIC HEAD, FOR SELECTIVELY LOCATING A LEAD SCREW AND AN APPARATUS THEREFOR

Albert S. Chou, Monte Sereno, and Frank M. Balbas, San Jose, both of Calif., assignors to Shugart Associates, Sunnyvale, Calif.

Filed Sep. 17, 1976, Ser. No. 724,701

Int. Cl.² G11B *5/56, 5/43, 5/012*

U.S. Cl. 360—76 **16 Claims**

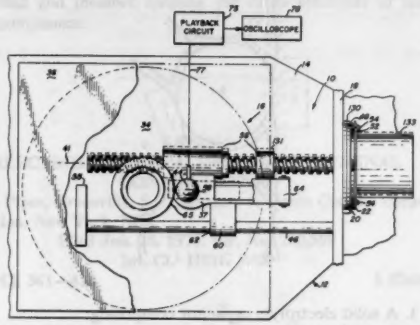
1. A method of inspecting the skew angle of the transducing gap of a magnetic head in a disk drive having a rotatable spindle and means carrying the magnetic head along a radial of the spindle, comprising:

providing a rotatable disk having several concentric circular recording tracks including one particular track having elongated bits of information magnetically recorded at a

plurality of predetermined acute angles measured relative to intersecting radial lines of said disk, said acute angles being in a range between a first angle in the counterclockwise direction relative to a radial line and a second angle in the clockwise direction relative to a radial line;

mounting said disk upon the rotatable spindle;

disposing the magnetic head in a read position relative to the bits of said one track as said disk is rotated;



rotating said disk such that for every bit passing said magnetic head produces a read signal having an amplitude proportional to the difference in angular orientation between said gap and the bit; and

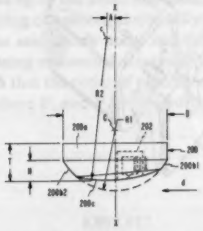
monitoring the amplitudes of said read signals, and comparing such amplitudes to a predetermined reference to determine whether or not the skew angle of the gap is acceptable.

4,097,909

MAGNETIC TRANSDUCER WITH INNER AND OUTER MAGNETIC MEDIUM COOPERATING SURFACE ZONES OF DIFFERENT CONVEXITY

Francis Kong King, Rochester, and Jon Jay Schmidt, Stewartville, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,765
Int. Cl.[2] G11B *5/82*
U.S. Cl. 360—99 **9 Claims**



1. A transducer adapted to have a data transferring relationship with a flexible medium comprising:

a body formed with a first surface zone within and bounded by a second surface zone,

a magnetic core having a gap therein which is on the surface of said first zone,

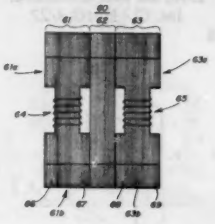
each of said zones having a rounded convex external surface and a ring-shaped boundary and said first zone being of less convexity than said second zone whereby said gap lies in close proximity to said flexible medium as the medium moves across said surface zones.

4,097,910

SINGLE GAP MAGNETIC READ HEAD

James O. Lafevers, and Charles T. Kao, both of Richardson, Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Jun. 25, 1976, Ser. No. 700,026
Int. Cl.[2] G11B *5/16*; G06K *7/00*
U.S. Cl. 360—126 **12 Claims**



1. A single gap magnetic read head, comprising:

a plurality of sensing elements each having an air gap aligned along a single gap line and positioned adjacent each other in side-by-side magnetic contact, each sensing element including:

first and second core segments joined at one end and spaced apart at a second end to form the air gap of each element, and

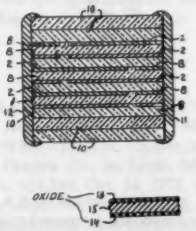
a pickoff coil wound about one of the core segments of each sensing element, the pickoff coils alternately wound about the first core segment of one element and the second core segment of an adjacent element.

4,097,911

BASE METAL ELECTRODE CAPACITOR AND METHOD OF MAKING THE SAME

John F. Dorrian, Erie, Pa., assignor to Erie Technological Products, Inc., Erie, Pa.

Filed Oct. 6, 1975, Ser. No. 620,244
Int. Cl.[2] H01G *1/01, 4/12*
U.S. Cl. 361—305 **20 Claims**



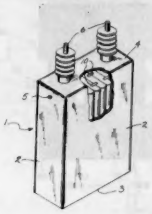
10. A monolithic capacitor having a sintered unitary body of sintered green titanate ceramic and electrodes embedded in the sintered green ceramic, the electrodes being of metal M, where M is selected from the group consisting of transition metals and/or transition metal alloys, the body having been sintered in an atmosphere of oxygen partial pressure low enough so that the skins of the electrodes oxidize and react with the ceramic and prevents conversion of the ceramic to the semiconductive state and the cores of the electrodes remain in the metallic state.

4,097,912

ELECTRICAL CAPACITOR HAVING AN IMPREGNATED DIELECTRIC

John Lapp, Franklin, and Fred S. Sadler, Racine, both of Wis., assignors to McGraw-Edison Company, Elgin, Ill.

Continuation-in-part of Ser. No. 456,867, Apr. 1, 1974, abandoned. This application Jan. 20, 1975, Ser. No. 542,391
The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.
Int. Cl.[2] H01G 4/22
U.S. Cl. 361—318 21 Claims



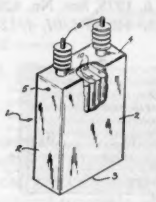
1. An electrical capacitor, comprising a sealed casing, a capacitor pack in the casing and having a pair of electrically conductive strips and a pair of dielectric layers wound alternately to form the capacitor pack, and a dielectric liquid composition impregnating said dielectric layers, said dielectric composition comprising a mixture of a mono-halogenated diphenyl oxide and a mono-halogenated alkyl diphenyl oxide where the alkyl group contains from 1 to 20 carbon atoms in the molecule, and said dielectric layers being composed of polymeric film said capacitor having a high discharge inception voltage over its normal operating temperature range.

4,097,913

ELECTRICAL CAPACITOR HAVING AN IMPREGNATED DIELECTRIC SYSTEM

John Lapp, Franklin, and Fred S. Sadler, Racine, both of Wis., assignors to McGraw-Edison Company, Elgin, Ill.

Continuation-in-part of Ser. No. 542,391, Jan. 20, 1975, which is a continuation-in-part of Ser. No. 456,867, Apr. 1, 1974, abandoned. This application Sep. 15, 1975, Ser. No. 613,073
The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.
Int. Cl.[2] H01G 4/22
U.S. Cl. 361—318 20 Claims



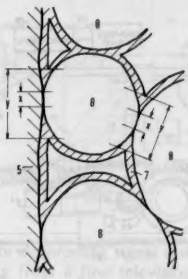
1. An electrical apparatus, comprising a pair of electrical conducting elements disposed in spaced relation with respect to each other and adapted to provide an electrical potential therebetween, and a dielectric system interposed between said elements, said dielectric system comprising a dielectric material composed of polymeric film and cellulosic fiber material, and a liquid dielectric composition impregnated into said dielectric material, said dielectric composition comprising a mixture of a mono-halogenated diphenyl oxide and a mono-halogenated alkyl diphenyl oxide where the alkyl group contains from 1 to 20 carbon atoms in the molecule, said apparatus having a high discharge inception voltage over its normal operation temperature range.

4,097,914

SOLID ELECTROLYTE CAPACITOR

Werner Schnabel, Nattheim, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 5, 1976, Ser. No. 664,264
Claims priority, application Germany, Mar. 5, 1975, 2509613
Int. Cl.[2] H01G 9/00
U.S. Cl. 361—433 10 Claims



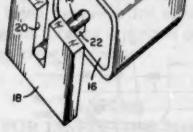
1. A solid electrolyte capacitor comprising:
a sintered anode of film-forming metal, said anode being coated with a dielectric active oxide layer,
a cathode formed on said dielectric active oxide layer oppositely of said anode,
said cathode consisting of a semiconductive metal oxide,
a graphite layer including graphite particles disposed on said cathode, and
an additional semiconductive metal oxide layer with higher specific resistance than said cathode disposed on said cathode adjacent to and in between the graphite particles of said graphite layer.

4,097,915

QUADRIPLANAR CAPACITOR

Gerald M. Locke, Saco, Me., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,297
Int. Cl.[2] H01G 9/00
U.S. Cl. 361—433 6 Claims



1. A quadriplanar component comprising:
an electrically conductive component enclosure open at one end, the opening defining edge portion of said enclosure forming a quadrilateral, said enclosure forming one electrode of said component,
a component element,
a lead fixedly attached to said element, said element being disposed within said enclosure in electrical relationship therewith with said lead extending outwardly from said open end substantially perpendicularly to the plane of said quadrilateral, and
a flat member having opposing flat surfaces, said surfaces substantially corresponding in size and shape to that of

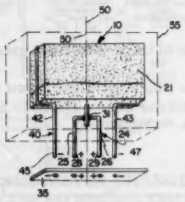
said quadrilateral, said flat surfaces having an aperture therein suitable to accommodate said lead, the outwardly extending end of said lead being disposed within said aperture and said member being rigidly attached to said lead with the planes of said flat surfaces being substantially perpendicular to the longitudinal axis of said lead, the peripheral edges of said member being substantially parallel to the opening defining edges of said enclosure, said lead and member forming the other electrode of said component.

4,097,916

ELECTROLYTIC CAPACITOR LEAD TERMINAL CONFIGURATION

John Piper, Greenville, S.C., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 28, 1976, Ser. No. 700,589
Int. Cl.[2] H01G *9/00*
U.S. Cl. 361—433 **1 Claim**



1. A polar capacitive device comprising a porous valve-metal anode body having (i) a dielectric oxide film formed thereon, (ii) a solid electrolyte layer over the dielectric oxide film, (iii) a conductive counterelectrode covering a major portion of the exterior surface of the anode body, a first pair of relatively closely spaced and adjacent terminal leads and a second pair of terminal leads spaced further apart than said first pair of terminal leads, all of said terminal leads having end portions remote from said anode body, the end portions of each pair being symmetric about an axis lying between the first pair of terminal leads, the axis and the end portions of both pairs of terminal leads being parallel and lying in the same plane and extending in the same direction, one of said pair of terminal leads being connected electrically to said counterelectrode coating on said anode body and the other said pair of terminal leads being connected electrically to the valve-metal anode body such that the order of polarity of the terminal leads is P_1-P_2-P_2-P_1 where P_1 and P_2 represent opposite polarities.

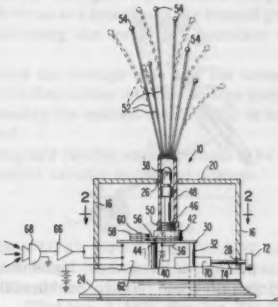
4,097,917

ROTATABLE LIGHT DISPLAY

Robert E. McCaslin, 81 Anchor Dr., Pittsburg, Calif. 94565

Filed Jun. 7, 1976, Ser. No. 693,384
Int. Cl.[2] F21V *7/04, 21/30*
U.S. Cl. 362—32 **13 Claims**

1. A rotatable light display comprising: a support; a plurality of elongated, flexible members; means carried by the support and rotatable relative thereto for rotatably mounting said members thereon with the members extending outwardly from the support in directions generally longitudinally of the axis of rotation of said mounting means; means coupled with said members for defining light sources at their outer ends; a motor having a rotatable drive shaft; means connecting the drive shaft to said mounting means for rotating said members relative to the support when the motor is energized; and means responsive to acoustic signals and coupled to said motor for applying electronic signals thereto to energize the same.



4,097,918

ILLUMINATED SPACE DIVIDING WALL PANEL SYSTEM

William C. Anderson, Grand Rapids; Gordon J. Cooper, Alto, and Charlie R. Tyke, Cascade, all of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 17, 1977, Ser. No. 797,894
Int. Cl.[2] F21S *1/02*
U.S. Cl. 362—147 **10 Claims**

1. A space dividing wall panel and lighting fixture combination comprising:

at least one planar, vertically oriented, space dividing wall panel having an upper horizontal edge portion,

an elongated lighting fixture spaced above and overlying, at least in part, said upper horizontal edge portion of said at least one space dividing wall panel,

a pair of spaced connecting means on the underside of said elongated lighting fixture,

a pair of lighting fixture support means, said lighting fixture support means each including mounting means at one end thereof constructed and arranged to associate with the upper horizontal edge portion of said space dividing wall panel and complementary connecting means at the other end thereof constructed and arranged to interconnect with one of said spaced connecting means on the underside of said elongated lighting fixture.

4,097,919

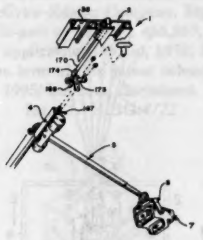
ILLUMINATION SYSTEM

Mitchell Bobrick, Redondo Beach, Calif.; Murray L. Quin, St. Louis, and Morris M. Buzan, St. Charles, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 625,586, Oct. 24, 1975, Pat. No. 4,032,775, which is a division of Ser. No. 496,879, Aug. 12, 1974, Pat. No. 3,936,671. This application Nov. 19, 1976, Ser. No. 743,177
Int. Cl.[2] F21V *21/26*
U.S. Cl. 362—270 **2 Claims**

1. A hospital reading-examination light comprising a housing of electrically insulative material, having bottom, top, and side walls diverging from an open mouth; a radiation shield of specular heat conductive material spaced from and lying along a major area of the inside surface of the said walls between said mouth and a rear opening; a tubular heat sink of heat-conductive material, said heat sink having a multiplicity of spaced, heat radiating fins projecting outwardly, said fins defining with said radiation shield a multiplicity of air passages between said

mouth and said rear opening; a reflector mounted on and extending within the tubular heat sink, said reflector having a



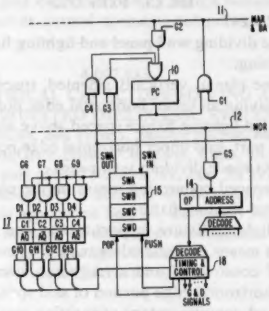
lamp-receiving opening in it, and a high-intensity lamp mounted to project within said reflector within said heat sink.

4,097,920

HARDWARE CONTROL FOR REPEATING PROGRAM LOOPS IN ELECTRONIC COMPUTERS

Stanley Edward Ozga, Willingboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 13, 1976, Ser. No. 749,971
Int. Cl.[2] G06F 9/06
U.S. Cl. 364—200 **3 Claims**



1. In a system for executing loops of programmed instructions, said system including instruction addressing means for storing the memory address of a next instruction to be executed, instruction execution register means having an operation part and at least one address part for storing signals representing an instruction being executed, and control means including timing means for producing control signals in response to signals including signals from the operation part of said instruction execution register means, the improvement comprising:

stack register means coupled to receive the contents of the instruction addressing means for storing addresses from said instruction addressing means in response to said control signals generated by certain non-branching instructions in said instruction execution register means, said stack register means including output means for providing signals representing the most recent instruction address stored; and

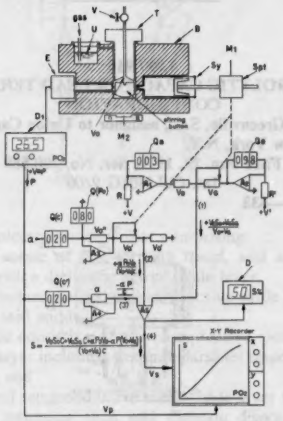
gating means responsive to said control signals generated by other certain instructions in said instruction execution register means and to said stack register output means for gating signals from said stack register output means into said instruction addressing means.

4,097,921

METHOD AND APPARATUS FOR AUTOMATICALLY DETERMINING THE DILUTION CURVE OF A SOLUTION, PARTICULARLY THE OXYGEN DISSOCIATION CURVE OF BLOOD OR HEMOGLOBIN SOLUTIONS

Italo Raffaele, Milan, Italy, assignor to Luigi Rossi, Milan, Italy

Continuation-in-part of Ser. No. 598,163, Jul. 22, 1975, abandoned. This application Nov. 24, 1976, Ser. No. 744,825
Claims priority, application Italy, Jul. 26, 1975, 25627 A/75
Int. Cl.[2] G01N 33/16
U.S. Cl. 364—416 **9 Claims**



7. An apparatus for automatically determining the oxygen dissociation curve of the whole blood or of hemoglobin solutions, comprising:

a thermostated mixing and measuring chamber,

first dosing means for feeding to the said chamber blood saturated with oxygen at a predetermined level;

second dosing means for feeding to the said chamber deoxygenated blood; means for measuring the partial pressure of the oxygen on the mixture which is formed in said chamber and converting the measurement into an electrical signal; an analogic computer, for receiving said signal and containing basic or reference data related to the oxygenated blood for calculating, in real time with respect to the mixing, the functions $S = f(P_{O_2})$ and Total $O_2 = f'(P_{O_2})$, and recording means for recording the calculated values of the two above said functions.

4,097,922

AUTOMATIC REAL TIME NAVIGATION COMMUNICATOR

John L. Vito, and Roderick S. Mesecar, both of Corvallis, Oreg., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 8, 1976, Ser. No. 739,411
Int. Cl.[2] H03K 13/24; G06F 15/50
U.S. Cl. 364—443 **10 Claims**

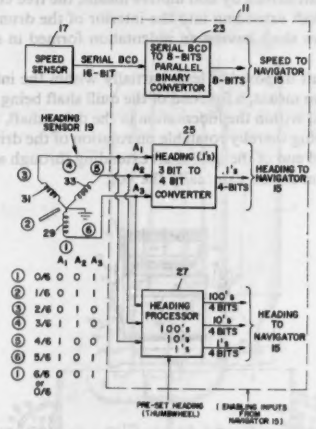
1. An automatic real time navigation communicator for use with a satellite navigator wherein the heading defined by the navigator is defined by a first binary word defining hundreds, a second binary word defining tens, a third binary word defining ones and a fourth binary word defining tenths and for use with a sensor that defines change in heading by a fifth binary word defining sixths wherein:

(a) said communicator includes a first binary counter, a second binary counter and a third binary counter connected in series and for respectively storing and counting hundreds, tens and ones;

(b) first means for loading said first, second and third count-

ers with binary bits that correspond with the same binary bits as in said first, second and third binary words;

(c) second means responsive to changes in said fifth binary



word for modifying the binary word in said third counter; and

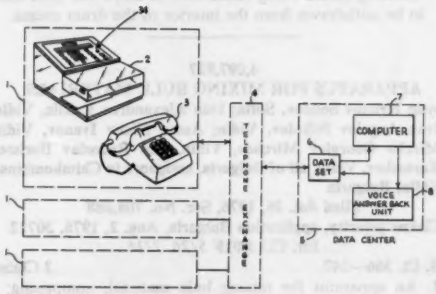
(d) third means for transferring the binary words in said first, second and third counters to said satellite navigator.

4,097,923

REMOTE POSTAGE METER CHARGING SYSTEM USING AN ADVANCED MICROCOMPUTERIZED POSTAGE METER

Alton B. Eckert, Jr., Norwalk; Howell A. Jones, Jr., Southport, and Frank T. Check, Jr., Hamden, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 16, 1975, Ser. No. 568,460
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—900 **30 Claims**



1. A method of funding a postage meter with a variable amount of postage, said postage meter being remote from a data center and having means for conditioning said postage meter to operate in either a first mode wherein the user of the postage meter can select an amount of postage to be printed or a second mode wherein the user can recharge the postage meter with a variable amount of postage and a funding register means which is rechargable with an additional variable amount of postage, the method comprising the steps of:

(a) establishing communication with a data center funding computer;

(b) entering into the data center funding computer data identifying the postage meter to be funded;

(c) entering into the data center funding computer data representing a desired variable amount of postage to be entered into said funding register means of said postage meter;

(d) processing said data representing the desired variable amount of postage to generate a unique combination which varies as a function of the entered postage data; and

(e) conditioning the meter for operation in said second mode;

(f) entering the postage data and the unique combination from the data center into the postage meter;

(g) processing the entered combination in said postage meter; and

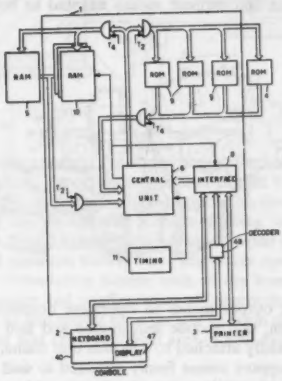
(h) causing said funding register means to be recharged with the desired variable amount of postage.

4,097,924

COMPUTER OPERATOR GUIDE DEVICE

Mario Figini, Bosco Marengo (Alessandria), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Sep. 3, 1976, Ser. No. 720,472
Claims priority, application Italy, Sep. 11, 1975, 69260 A/75
Int. Cl.[2] G06F *15/02, 3/14;* G06K *15/18*
U.S. Cl. 364—900 **3 Claims**



1. In a computer, accounting or similar programmable machine having a keyboard for entering information represented by a series of multibit words and a stored program processing unit for processing said information, an operator guide device comprising a display device controlled by said processing unit for displaying to the operator a number of machine status warnings, said display device including a single character display cell adapted to display one character at a time of a group of characters which can be defined by one word of information, said characters being formed of a plurality of signs individually actuatable by a corresponding signal, and a decoder for selectively actuating a combination of said signs in response to a word received by said processing unit by generating a corresponding combination of signals, whereby a plurality of symbols can be displayed corresponding to a plurality of configurations of a single word output by said processing unit.

4,097,925

PROCESS AND APPARATUS FOR MIXING AND TRANSPORTING CEMENT

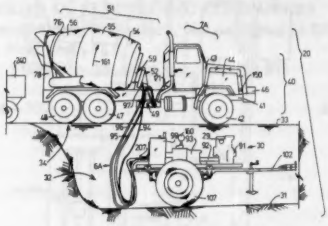
William H. Butler, Jr., 5315 Alvarado, Amarillo, Tex. 79106

Filed Mar. 15, 1976, Ser. No. 666,604
Int. Cl.[2] B28C *5/18, 5/42, 9/04*
U.S. Cl. 366—2 **8 Claims**

1. A system comprising a plurality of like rotary concrete mixer and transport trucks and a mobile emergency power unit; said rotary concrete and transport mixer trucks each comprising, in operative combination, a truck frame, an engine, a hydraulic pump and a hydraulic motor, a gear train and a

concrete mixer container, said engine operatively connected to and driving said pump, said pump in operative connection to and driving said motor, said motor operatively connected to and driving said gear train through a connection therebetween, said gear train operatively connected to and driving said concrete mixer container, said connection between said motor and said gear train being detachable, said truck frame having a longitudinally extending axis parallel to its length, said concrete mixer container located above said truck frame and being axially symmetrical and rotatable about a central longitudinal axis directed upward and rearwards, means in said concrete mixer container to move a fluid concrete mass longitudinally of said container, each said concrete mixer and transport truck being unstable beyond a prdetermined degree of tilt relative to the horizontal about the longitudinal axis of said truck frame,

said mobile emergency power unit consisting essentially of a mobile unit frame, a mobile unit engine, a mobile unit hydraulic pump, a plurality of flexible conduits and a mobile unit motor, said mobile unit engine operatively connected to said mobile unit pump and said mobile unit pump permanently connected through said flexible conduits to said mobile unit motor, said mobile unit motor comprising a mechanical output means connectable to said gear train and support means adapted to hold said mechanical output means in operative connection to said gear train, said mobile unit engine and said mobile unit pump fixedly attached to a mobile unit frame, mobile unit motor support means firmly attached to said mobile unit frame, said mobile unit motor is releasably supported on said mobile unit motor support means during transport of said motor on said mobile unit frame, said flexible conduits then extending between said mobile unit pump and said mobile unit motor from a point on said mobile unit pump furthest from said mobile unit engine to a point on said mobile unit engine furthest from said mobile unit pump and being extensible from said mobile unit, said mobile unit frame having a longituidinal axis extending parallel to its length, said mobile unit engine having a mobile unit engine frame and mobile unit engine output means and adapted to apply torque to said mobile unit frame in one direction and said mobile unit pump having a mobile unit pump frame and means adapted to apply an equal torque to said mobile unit frame in a direction opposite to said one direction, and wherein said mobile emergency power unit is stable at a greater degree of tilt relative to the horizontal about the longitudinal axis of said mobile unit frame than the predetermined degree of tilt relative to the horizontal axis of said truck frame beyond which said concrete mixer and transport truck is unstable.



4,097,926

MIXER PADDLE SHAFT ASSEMBLY

Samuel A. Face, Jr., 1008 Magnalia Ave., Norfolk, Va. 23508

Filed Feb. 22, 1977, Ser. No. 770,530
Int. Cl.[2] B28C *5/14, 7/16*
U.S. Cl. 366—46 **9 Claims**

1. Apparatus for mixing materials together comprising, in combination:

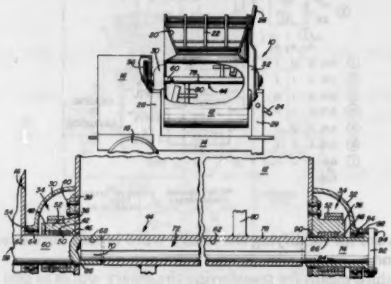
frame means;

drum means mounted on said frame means for receiving said materials for mixing thereof;

motive means mounted on said frame means;

a drive shaft driven by said motive means, the free end of the drive shaft extending into the interior of the drum means, the drive shaft having an indentation formed in said free end;

a quill shaft disposed at least partially within the interior of the drum means, a first end of the quill shaft being slidably received within the indentation in the drive shaft, the quill shaft being thereby rotatable on rotation of the drive shaft, a second end of the quill shaft extending through an end of the drum means externally thereof;



a hollow shaft having a longitudinal channel extending therethrough, the quill shaft being slidably received within the channel, the hollow shaft being rotatable on rotation of the quill shaft;

mixing paddle means joined to the hollow shaft and extending therefrom to mix materials within said drum means;

first bearing means for mounting the drive shaft for rotation relative to the drum means;

second bearing means for mounting the second end of the quill shaft for rotation relation to the drum means; and

retaining means external of the drum means for maintaining the quill shaft in connecting relation to the drive shaft, the retaining means being releaseable to allow the quill shaft to be withdrawn from the interior of the drum means.

4,097,927

APPARATUS FOR MIXING BULK MATERIALS

Stoyan Hristov Sendov, Sofia; Ivan Alexandrov Kuklin, Vidin; Ivan Angelov Nikolov, Vidin; Assen Ninov Ivanov, Vidin; Mircho Georgiev Mirchev, Vidin, and Radoslav Borissov Kurtashev, Vidin, all of Bulgaria, assignors to Chimkombinat, Vidin, Bulgaria

Filed Jul. 26, 1976, Ser. No. 708,688
Claims priority, application Bulgaria, Aug. 2, 1975, 30712
Int. Cl.[2] B01F *5/26, 7/16*
U.S. Cl. 366—247 **2 Claims**

1. An apparatus for mixing bulk material, comprising: a vertically elongated upright cylinder formed with a sloping bottom;

an internal pipe extending upwardly in said cylinder along the axis thereof and opening at a free end below the top of said cylinder into the interior thereof;

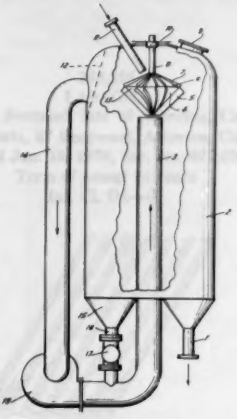
a centrifugal blower having a discharge side connected to said pipe;

an intake duct connected to the intake side of said blower and disposed externally of said cylinder, said intake duct communicating with the interior of said cylinder above said free end of said pipe;

a rotatable vaned mixing rotor freely rotatable in said cylinder and disposed above said free end for propulsion by fluid emerging therefrom; and

an inlet pipe for delivering material to be mixed with the bulk material in said container and depositing same upon

said rotor, said rotor comprising a lower cone and an upper cone, said cones being connected at their bases, said



lower cone being formed with bow-shaped curved blades and said upper cones being formed with radial blades.

4,097,928

APPARATUS FOR FEEDING SYNTHETIC MATERIAL TO A MOULD

Bernd Fries, Nuremberg, Germany, assignor to DEMAG Kunststofftechnik Zweigniederlassung der DEMAG AG, Nuremberg, Germany

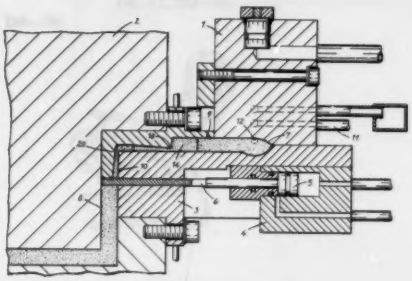
Continuation of Ser. No. 503,116, Sep. 4, 1974, abandoned. This application Apr. 28, 1976, Ser. No. 681,237

Claims priority, application Germany, Sep. 14, 1973, 2346348

Int. Cl.[2] B28B *13/02;* **B01F** *5/00*

U.S. Cl. 366—336 **8 Claims**

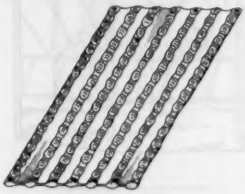
4. Apparatus for feeding synthetic material composed of at least two constituents to a mould, such apparatus comprising a mixing chamber, means for feeding the constituents under pressure to the mixing chamber for mixing the same therein, and a sprue runner, said sprue runner having an exit of given cross-sectional area being arranged for feeding the material from said mixing chamber to said mould from said exit at substantially atmospheric pressure, the sprue runner extending from a single mixing chamber outlet and including branch means, said branch means having at least two separate branches and being arranged so that material fed from the mixing chamber is divided into at least two equal parts separated from one another, the sprue runner further including a common section, the separate branches of said branch means leading to said common section in which the divided parts of the material are recombined prior to feeding to the mould, each branch of said branch means being of equal length, opening into said common section via a respective opening having at least one constriction therein with all the branches having the same number and configuration of constrictions, whereby material fed to said mould has a largely uniform distribution of velocity over said cross sectional area of said exit.



DESIGNS

JUNE 27, 1978

248,256
LASAGNA
Leo A. Poliano, deceased, late of Atherton, Calif., by Adele Poliano, executrix, 87 Rosewood, Atherton, Calif. 94025
Filed Jun. 18, 1976, Ser. No. 697,406
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—14

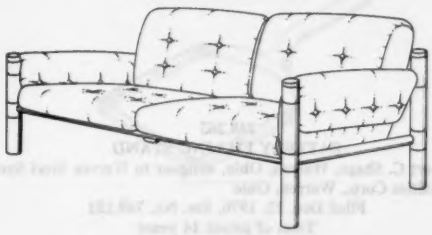


248,257
MONEY BELT
John A. Renick, Tampa, Fla., assignor to John Renick Enterprises, Inc., Tampa, Fla.
Filed Aug. 9, 1976, Ser. No. 713,614
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—380

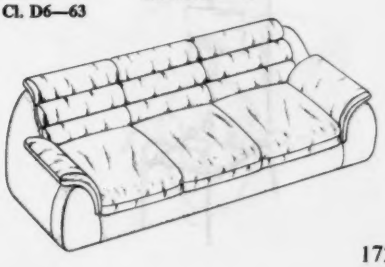
248,258
ANKLE WALLET OR THE LIKE
Frank Munari, Maspeth, N.Y., assignor to Security Designs, a Div. of Munhill Corp., Maspeth, N.Y.
Filed Oct. 13, 1976, Ser. No. 732,161
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—383

248,259
CHAIR
Arnt Lande, Aasestranda, Norway, assignor to WESTNOFA, West Norway Factories Ltd. A/S
Filed Apr. 2, 1976, Ser. No. 673,069
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

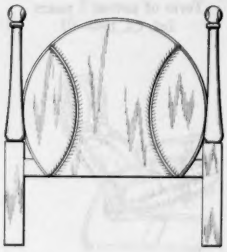
248,260
SEAT
Robert L. Wilson, Senatobia, Miss., assignor to Chromcraft Corporation, Amsterdam, N.Y.
Filed Oct. 6, 1976, Ser. No. 730,047
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



248,261
COUCH
Richard McCarthy, Winston-Salem, N.C., assignor to Kanowsky Manufacturing, Inc., Sacramento, Calif.
Filed Oct. 7, 1976, Ser. No. 730,466
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

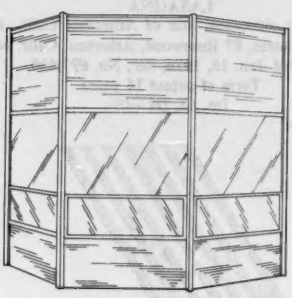


248,262
BED HEADBOARD
Gary M. Robichaud, Coventry, R.I., assignor to Leonard Michaelson, Providence, R.I.
Filed Apr. 12, 1976, Ser. No. 676,201
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—79

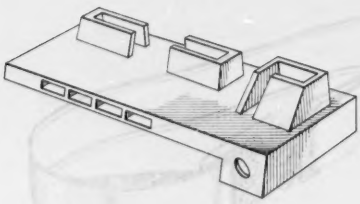


248,263
BATTERY FILLING STAND
Robert C. Shape, Warren, Ohio, assignor to Warren Steel Specialties Corp., Warren, Ohio
Filed Dec. 22, 1976, Ser. No. 748,151
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85

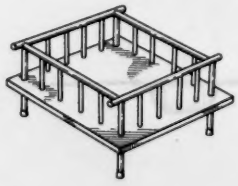
248,264
KIOSK
Harry E. Coleman, 3609 McLee Dr., Alexandria, La. 71301
Filed Mar. 12, 1976, Ser. No. 666,445
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—149



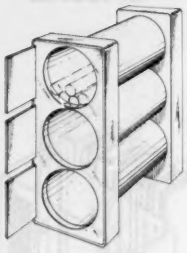
248,265
CHECK WRITING DESK
David A. O'Connor, Norfolk, Va., assignor to Virginia National Bankshares, Inc., Norfolk, Va.
Filed Mar. 23, 1976, Ser. No. 669,605
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157



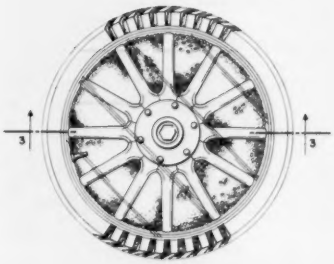
248,266
STAND FOR FLOWERS OR THE LIKE
Walter T. Kola, 1418 Highland, Joliet, Ill. 60435
Filed May 4, 1977, Ser. No. 793,560
Term of patent 14 years
Int. Cl. D6—*06, 04*
U.S. Cl. D6—183



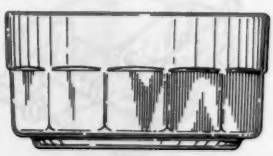
248,267
DISPLAY RACK
Patrick J. Mitchell, 836 Industry Dr., Tukwila, Wash. 98188
Filed Jan. 6, 1977, Ser. No. 757,368
Term of patent 14 years
Int. Cl. D20—*02*; D6—*04*
U.S. Cl. D6—188



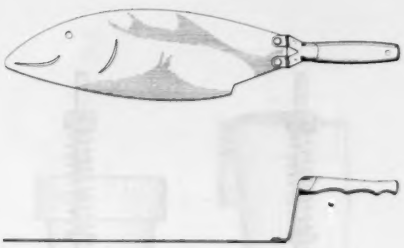
248,268
TABLE TOP
Robert Fields, 279 Wentworth, Glencoe, Ill. 60022
Filed Sep. 8, 1976, Ser. No. 722,074
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—193



248,269
RAMEKIN
Don Schreckengost, East Liverpool, Ohio, assignor to The Salem China Company, Salem, Ohio
Filed Oct. 7, 1976, Ser. No. 730,155
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—28



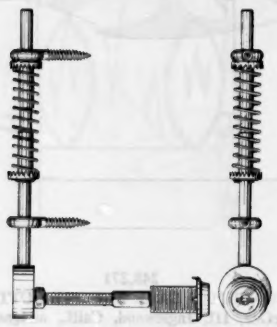
248,270
SPATULA
Janet Wagner Petit, 2713 NE. 21st Ave., Ft. Lauderdale, Fla. 33306
Filed Jun. 4, 1976, Ser. No. 692,792
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—102



248,271
COMBINED CAKE AND PIE CUTTER
Richard McGee, III, Inglewood, Calif., assignor to Marcos Fastlicht, by said Richard McGee, III, a part interest to each
Filed Jan. 25, 1977, Ser. No. 762,288
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—142

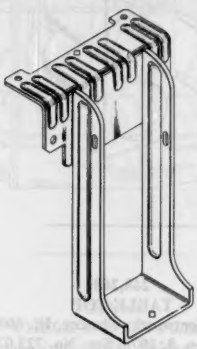
248,272
CONTROL LEVER KNOB
Douglas Hood Grambush, Irvine, Calif., assignor to Deere & Company, Moline, Ill.
Filed Jun. 28, 1976, Ser. No. 700,602
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—307

248,273
GARAGE DOOR LOCKING DEVICE
John P. Durban, 29402 Vista Plaza Dr., Laguna Niguel, Calif. 92677
Filed Sep. 3, 1976, Ser. No. 720,109
Term of patent 3½ years
Int. Cl. D8—*07*
U.S. Cl. D8—331

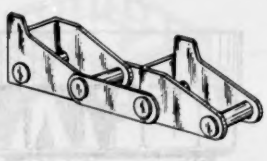


248,274
ALL PURPOSE ANCHOR
George W. Kingston, Chevy Chase, Md., and David R. Norcross, Washington, D.C., assignors to Timber Engineering Co., Washington, D.C.
Filed Aug. 5, 1976, Ser. No. 712,071
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354

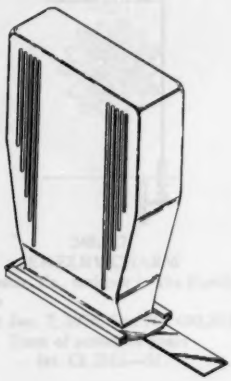
248,275
JOIST HANGER
Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.
Filed Mar. 24, 1976, Ser. No. 670,100
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—380



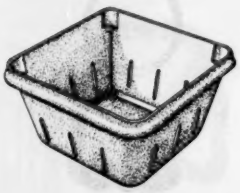
248,276
LINK UNIT FOR CONVEYOR CHAIN LINK ASSEMBLY
Dale R. Schwartz, R.R. 2, Hedrick, Iowa 52563
Filed Mar. 29, 1976, Ser. No. 671,391
Term of patent 14 years
Int. Cl. D8—*99;* D12—*05*
U.S. Cl. D8—499



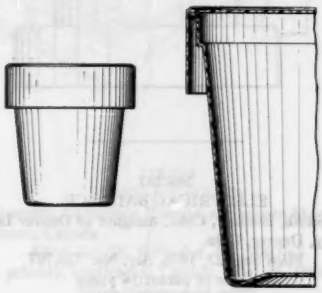
248,277
CONTAINER FOR TONER POWDER
Harlan Glenn Hartman, Hilton; Stephen James Flamini, Rochester, and Arthur Christian Rissberger, Jr., Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Continuation-in-part of Ser. No. 547,148, Feb. 5, 1975. This application Feb. 17, 1976, Ser. No. 658,211
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—207



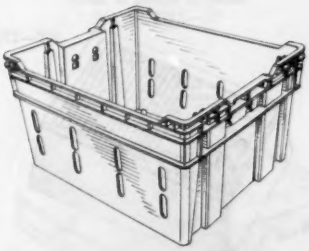
248,278
PACKAGING TRAY OR THE LIKE
Morell J. Holden, Jr., Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Aug. 8, 1975, Ser. No. 602,931
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



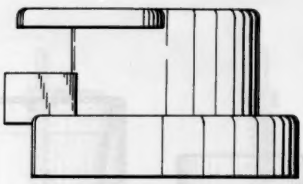
248,279
COVERED CONTAINER
David Goldsmith, Jamaica Estates, and Robert P. Gersin, New York, both of N.Y., assignors to Venture Foods Incorporation, New York, N.Y.
Continuation of Ser. No. 598,082, Jul. 22, 1975, abandoned. This application Apr. 1, 1977, Ser. No. 783,529
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—222



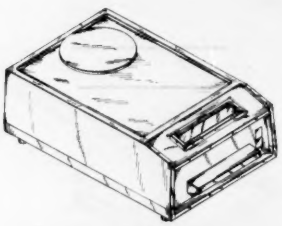
248,280
PRODUCE CONTAINER
Sam M. Martin, Etobicoke, Canada, assignor to Consumers Glass Company Limited
Filed Apr. 30, 1976, Ser. No. 682,114
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—243



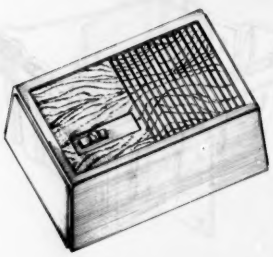
248,281
DISPENSING VALUE FOR A CONTAINER
Warren J. Schieser, Columbus; John R. Sneeden, Westerville; R. Alan Feltner, Columbus, and Curtis J. Bond, Marion, all of Ohio, assignors to Corco, Inc., Columbus, Ohio
Filed May 19, 1976, Ser. No. 688,084
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—275



248,282
ELECTRICAL BALANCE
James E. Smith, Boulder, Colo., assignor to Denver Instrument Company, Denver, Colo.
Filed Sep. 23, 1976, Ser. No. 725,707
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91



248,283
SMOKE DETECTOR
Keith D. Kitts, Glenview; Kenneth M. Hattori, Bensenville, and James H. Stade, Elkgrove Village, all of Ill., assignors to The Gillette Company, Boston, Mass.
Filed Aug. 27, 1976, Ser. No. 718,397
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—106



248,284
DISTRESS FLAG
Donald C. Bowser, 397 Thomas La., Girard, Ohio 44420
Filed Feb. 10, 1977, Ser. No. 767,621
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109

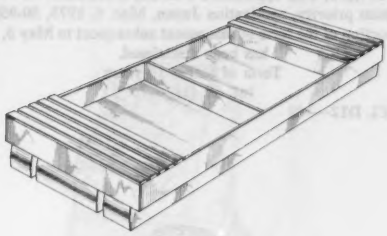
248,285
DIAMOND RING
Josef J. Barr, 293 S. County Rd., Palm Beach, Fla. 33480
Filed Jun. 28, 1976, Ser. No. 700,711
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—27

248,286
DIAMOND RING
Josef J. Barr, 293 S. County Rd., Palm Beach, Fla. 33480
Filed Jun. 21, 1976, Ser. No. 698,178
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—34

248,287
JEWELRY CHARM
Judy Sharp, Lancaster, Pa., assignor to The Family Jewels, Inc., Park City, Utah
Filed Jun. 7, 1976, Ser. No. 693,302
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—83

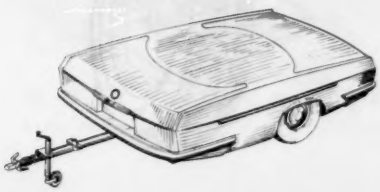
248,288
ORNAMENT OR THE LIKE
Virginia A. Maholias, 5575 S. 22nd St., Milwaukee, Wis. 53221
Filed May 18, 1976, Ser. No. 687,522
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—125

248,289
FLOATING GARDEN BOX
Nita M. Opitz, Truesdale Lake Dr., South Salem, N.Y. 10590
Filed Sep. 22, 1976, Ser. No. 718,683
Term of patent 14 years
Int. Cl. D11—*02*; D21—*03*
U.S. Cl. D11—156

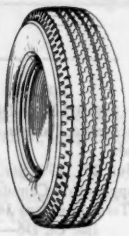


248,290
MOBILE LADDER
Marcel Guerette, Lachenaie, Canada, assignor to Moody Si Ltd., Terrebonne, Canada
Filed Jul. 23, 1976, Ser. No. 708,045
Claims priority, application Canada, May 20, 1976, 200576
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D12—59

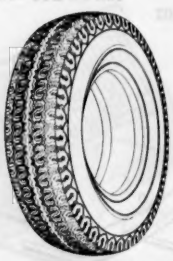
248,291
VEHICLE TRAILER
Kurt Rolf Boldt, 1942 E. Valley Rd., Montecito, Calif. 93108
Filed Jan. 14, 1977, Ser. No. 759,290
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—102



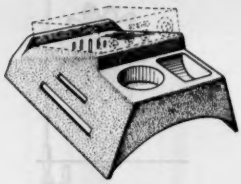
248,292
VEHICLE TIRE
Muneyoshi Maeda, No. 29-1, 2-Chome, Onta-Cho, Higashi-Murayama City, Tokyo; Hiroshi Kojima, No. 19-5, 4-Chome, Higashi-Toyota, Hino City, Tokyo, and Toshio Hayakawa, No. 2800-1, Ogawa-Higashi-Cho, Kodaira City, Tokyo, all of Japan
Continuation-in-part of Ser. No. 602,872, Aug. 7, 1975, Pat. No. Des. 244,181. This application Oct. 22, 1976, Ser. No. 734,802
Claims priority, application Japan, Mar. 6, 1975, 50-8591
The portion of the term of this patent subsequent to May 3, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



248,293
VEHICLE TIRE
Toshio Hayakawa, and Takao Sakamoto, both of Kodaira, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Dec. 13, 1976, Ser. No. 749,913
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



248,294
UNIVERSAL MOUNT FOR A CITIZEN BAND RADIO AND TAPE PLAYER
James E. McCutchen, 37 S. Del Norte Rd., Greenville, S.C. 29615
Filed Mar. 8, 1977, Ser. No. 775,648
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

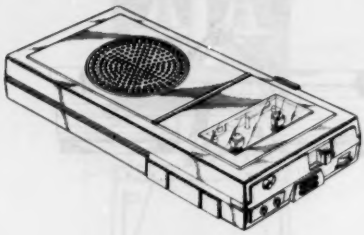


248,295
AUTOMOTIVE WHEEL
George E. Day, 1240 N. Ivy, Escondido, Calif. 92026, and R. W. Johnson, 559 Larchwood Dr., San Marcos, Calif. 92069
Filed Mar. 10, 1977, Ser. No. 776,201
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—206

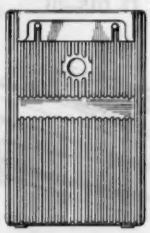
Fig. 1

Fig. 2

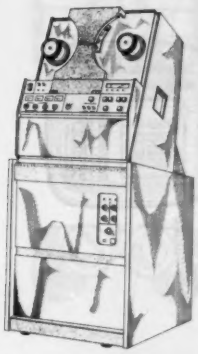
248,296
TAPE RECORDER
Toshihiko Kadota, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Apr. 26, 1976, Ser. No. 680,448
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



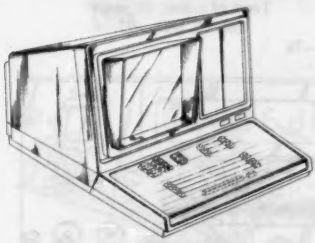
248,297
LOUD SPEAKER
Dieter Rams, Kronberg, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Feb. 26, 1976, Ser. No. 661,638
Claims priority, application Germany, Sep. 29, 1975, 738410
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—34



248,298
TAPE TRANSPORT
George A. Wilson, Portola Valley, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Mar. 17, 1976, Ser. No. 667,602
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—41

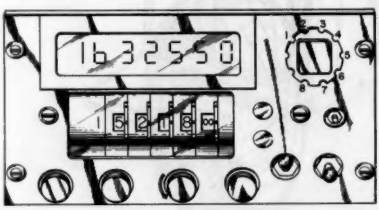


248,299
HOUSING FOR A DATA ENTRY TERMINAL
Samuel A. Morgan, Chelsea, and Raymond P. Kavlick, Ann Arbor, both of Mich., assignors to Sycor, Inc., Ann Arbor, Mich.
Filed Feb. 23, 1976, Ser. No. 660,162
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—45

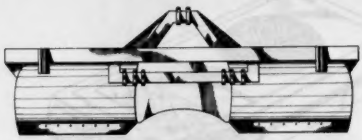


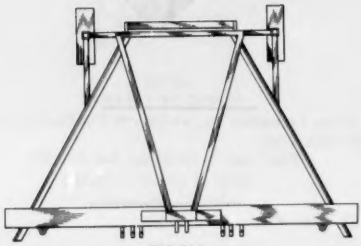
248,300
TELEPHONE
Isamu Hirasawa, Tokyo; Hirokazu Mokudai, Yamato, and Osamu Kato, Zama, all of Japan, assignors to Kanda Tsushin Kogyo Co., Ltd., Tokyo, Japan
Filed Feb. 9, 1977, Ser. No. 767,135
Claims priority, application Japan, Aug. 9, 1976, 51-30943
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—58

248,301
CONTROL AND DISPLAY PANEL FOR RADIO RECEIVERS OR THE LIKE
Robert Alan Gleaton, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.
Filed Jun. 17, 1976, Ser. No. 697,305
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—76

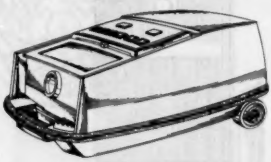


248,302
GROUND SCRAPER FOR CLOSING DITCHES AND THE LIKE
Richard D. Zoller, 124 Florimond Dr., Colusa, Calif. 95923
Filed Nov. 4, 1976, Ser. No. 738,831
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—32

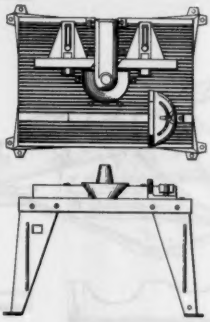




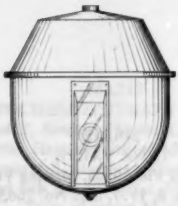
248,303
CANISTER VACUUM CLEANER OR SIMILAR ARTICLES
Fred E. Pearman, Jr., Five Forks Community, S.C., assignor to The Singer Company
Filed Nov. 12, 1976, Ser. No. 741,450
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—52



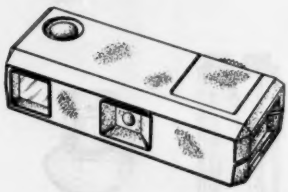
248,304
TABLE FOR PORTABLE CUTTING TOOLS
Wilfred M. McCord, Jr., and Boyko G. Varney, both of Louisville, Ky., assignors to Vermont American Corporation, Louisville, Ky.
Filed Sep. 3, 1976, Ser. No. 720,108
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—127



248,305
SURVEILLANCE CAMERA HOUSING
Perry Scott, 403 Twentieth St., Santa Monica, Calif. 90402
Filed Oct. 6, 1976, Ser. No. 729,884
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—02

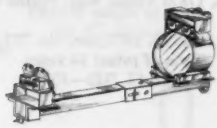


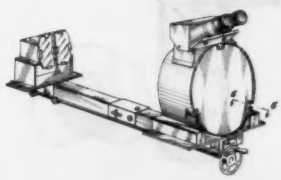
248,306
CAMERA
Rene C. Pinchuk, Kensington, Calif., assignor to Ehrenreich Photo-Optical Industries Inc., San Francisco, Calif.
Filed Jul. 6, 1976, Ser. No. 703,023
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—06



248,307
BINOCULAR
Paul R. Maguire, 4284 Sea View La., Los Angeles, Calif. 90065
Filed Sep. 27, 1976, Ser. No. 726,740
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—59

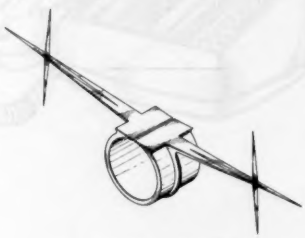
248,308
BINOCULAR REFLECTOR TELESCOPE
Theodore W. Richards, 1936 Sloat Blvd., San Francisco, Calif. 94116
Filed Dec. 13, 1976, Ser. No. 750,353
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—60





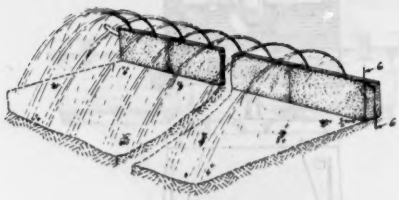
248,309
MOUNT FOR TELESCOPIC SIGHT
Gerald T. Weast, 23702 Crossley, Hazel Park, Mich. 48050
Filed Mar. 25, 1976, Ser. No. 670,226
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—7

248,310
GUN SIGHT
Borge Hestehave, 8031 Beechwood Dr., Alta Loma, Calif. 90701
Filed Sep. 18, 1973, Ser. No. 398,467
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—8

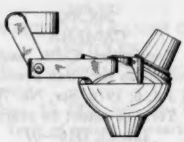


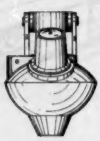
248,311
FISHING SINKER
George M. Raptis, 17876 Vicino Way, Pacific Palisades, Calif. 90272
Filed Mar. 15, 1977, Ser. No. 777,617
Term of patent 14 years
Int. Cl. D22—*30*
U.S. Cl. D22—30

248,312
SPRINKLER SYSTEM
John Zatorski, 18 Park Ave., North Arlington, N.J. 07032
Filed Feb. 9, 1976, Ser. No. 656,650
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7



248,313
TANK VALVE
George C. Henry, 26701 Via Alcala, Mission Viejo, Calif. 92675
Filed Feb. 9, 1977, Ser. No. 766,984
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

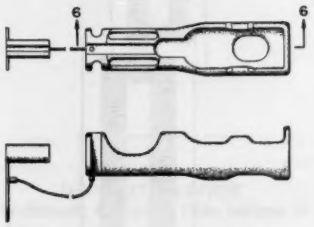




248,314
VIAL HOLDER AND UNIT GAUGE FOR HYPODERMIC SYRINGES

Edward E. Romero, 1367 Wayne Ave., San Leandro, Calif. 94577, and Charles L. Romero, 8160 Crow Canyon Rd., Castro Valley, Calif. 94546

Filed Jul. 2, 1976, Ser. No. 702,013
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—25



248,315
PHOTOCHEMOTHERAPY CHAMBER

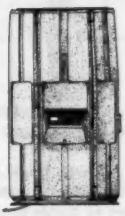
Ronald G. Blaisdell, Saugus; Harold L. Hough, Beverly, and Robert E. Levin, Hamilton, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 24, 1976, Ser. No. 660,947
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—39

248,316
MODULAR PHOTOCHEMOTHERAPY CHAMBER

Ronald G. Blaisdell, Saugus, and Harold L. Hough, Beverly, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 24, 1976, Ser. No. 660,969
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—39

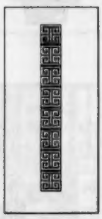


248,317
INFANT PACIFIER

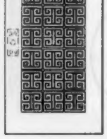
Paul K. Meeker, 412 Park, Kent, Ohio 44266, and Richard E. Cone, 249 Bowman Dr., Kent, Ohio 44240

Filed Sep. 2, 1976, Ser. No. 720,224
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—46

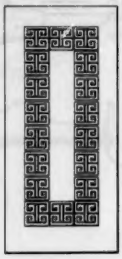
248,318
DECORATIVE DOOR
Warren G. Stichtenoth, Cincinnati, Ohio, assignor to American Standard Inc.
Division of Ser. No. 533,411, Dec. 16, 1974, Pat. No. 243,095. This application Jun. 14, 1976, Ser. No. 696,004
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48



248,319
DECORATIVE DOOR
Warren G. Stichtenoth, Cincinnati, Ohio, assignor to American Standard Inc.
Division of Ser. No. 533,411, Dec. 16, 1974, Pat. No. 243,095. This application Jun. 14, 1976, Ser. No. 696,005
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48

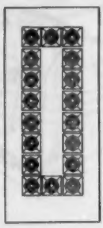


248,320
DECORATIVE DOOR
Warren G. Stichtenoth, Cincinnati, Ohio, assignor to American Standard Inc.
Division of Ser. No. 533,411, Dec. 18, 1974. This application Jun. 14, 1976, Ser. No. 696,006
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48

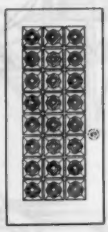


248,321
DECORATIVE DOOR
Warren G. Stichtenoth, Cincinnati, Ohio, assignor to American Standard Inc.
Division of Ser. No. 533,412, Dec. 16, 1974. This application Jun. 14, 1976, Ser. No. 696,007
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48

248,322
DECORATIVE DOOR
Warren G. Stichtenoth, Cincinnati, Ohio, assignor to American Standard Inc.
Division of Ser. No. 533,412, Dec. 16, 1974. This application Jun. 14, 1976, Ser. No. 696,008
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48

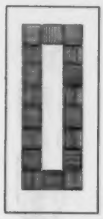


248,323
DECORATIVE DOOR
Warren G. Stichtenoth, Cincinnati, Ohio, assignor to American Standard Inc.
Division of Ser. No. 533,412, Dec. 16, 1974, Pat. No. D. 241,535. This application Jun. 14, 1976, Ser. No. 696,009
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48

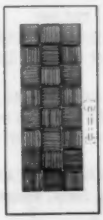


248,324
DECORATIVE DOOR
Warren G. Stichtenoth, Cincinnati, Ohio, assignor to American Standard Inc.
Division of Ser. No. 533,399, Dec. 16, 1974, Pat. No. D. 244,384. This application Jun. 14, 1976, Ser. No. 696,010
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48

248,325
DECORATIVE DOOR
Warren G. Stichtenoth, Cincinnati, Ohio, assignor to American Standard Inc.
Division of Ser. No. 533,399, Dec. 16, 1974, Pat. No. D. 244,384. This application Jun. 14, 1976, Ser. No. 696,011
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48



248,326
DECORATIVE DOOR
Warren G. Stichtenoth, Cincinnati, Ohio, assignor to American Standard Inc.
Division of Ser. No. 533,399, Dec. 16, 1974, Pat. No. Des. 244,384. This application Jun. 14, 1976, Ser. No. 696,012
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48



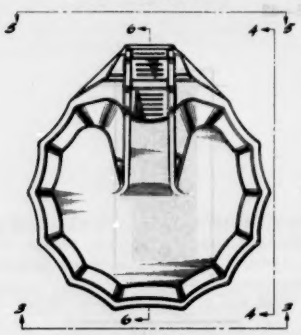
248,327
BUILDING TRIM
Donald A. South, 44538 State Rte. 14, Columbiana, Ohio 44408
Filed Sep. 30, 1976, Ser. No. 728,445
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

248,328
POST
Raymond Esunis, and Constance Esunis, both of 5N.651 Santa Fe Trail, Bartlett, Ill. 60103
Filed Nov. 4, 1976, Ser. No. 738,748
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—78

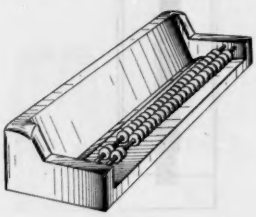
248,329
SMOKING STAND
Franco Gensini, Florence, Italy, assignor to Action Industries, Inc., Cheswick, Pa.
Filed Aug. 3, 1977, Ser. No. 821,420
Claims priority, application Italy, Feb. 22, 1977, 11533/77[U]
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—12

248,330
EXECUTIVE GAME INDICATOR
Lesmeri-Anne M. Postma, 1662 Camden Ave., West Los Angeles, Calif. 90025
Filed Aug. 13, 1976, Ser. No. 714,005
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 MM

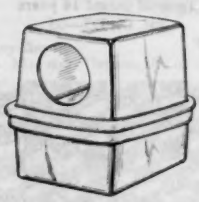
248,331
SPLASHER POOL WITH SLIDE AND INTEGRAL STEP
Ivan A. Ziegler, Dallas, Pa.; Harry T. Bowkley, Claremont, and Thaddeus W. Fuller, Pomona, both of Calif., assignors to Muskin Corporation, Colton, Calif.
Filed Sep. 20, 1976, Ser. No. 724,271
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 F



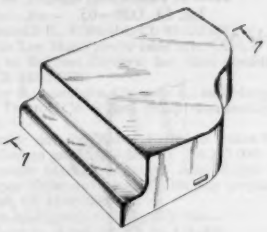
248,332
COMBINED DOMINO HOLDER AND SCORE COUNTER
Rex V. Bailey, deceased, late of Malakoff, Tex., by Hester Caroline Bailey, beneficiary and devisee, P.O. Box 494, Malakoff, Tex. 75148
Filed Nov. 26, 1976, Ser. No. 745,346
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 MM



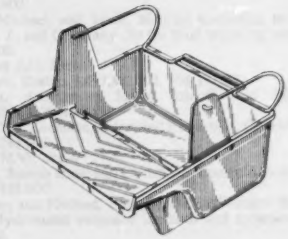
248,333
ANIMAL LITTER BOX
Donald Haugen, 709 W. Huron St., Ann Arbor, Mich. 48103
Filed Jan. 24, 1977, Ser. No. 761,980
Term of patent 14 years
Int. Cl. D30—*06*
U.S. Cl. D30—41



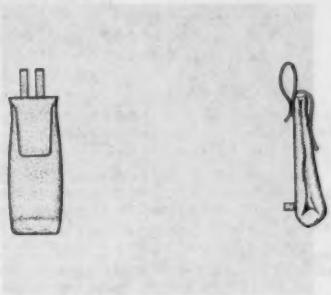
248,334
PROTECTIVE COVER FOR A PIANO
Joseph Stello, 808 Broadway, New York, N.Y. 10003
Filed Mar. 23, 1976, Ser. No. 669,673
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D56—1 B



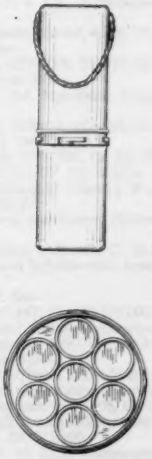
248,335
PAINT PAD BUCKET
Donald R. Cooke, Minneapolis, and Robert I. Janssen, St. Paul, both of Minn., assignors to Padco, Inc., Minneapolis, Minn.
Filed Mar. 21, 1977, Ser. No. 779,817
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D64—18



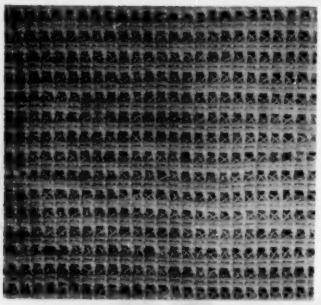
248,336
ARTICLE CARRYING BAG FOR ATTACHMENT TO A CRUTCH
Albert William Fink, 1825 N. Gramercy Pl., Los Angeles, Calif. 90020
Filed Jun. 28, 1976, Ser. No. 700,515
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—1 R



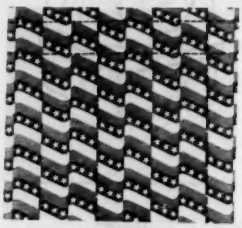
248,337
CARRYING CASE FOR ARTISTS BRUSHES
Max Marx, Box 142, 12 Portside Rd., Lake Hopatcong, N.J. 07849
Filed Oct. 21, 1976, Ser. No. 734,712
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



248,338
BLANKET FABRIC
Irving Gross, Providence, and Roger Guillemette, Tiverton, both of R.I., assignors to Fairhope Fabrics, Inc., Fall River, Mass.
Filed Apr. 21, 1975, Ser. No. 569,885
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 PP



248,339
FABRIC
Leo John Comensoli, Dural, and Gloria Dawn Smythe, Potts Point, both of Australia, assignors to Speeda Knitting Mills Pty. Ltd.
Filed Oct. 27, 1976, Ser. No. 736,044
Claims priority, application Australia, Apr. 27, 1976, 69069; Apr. 27, 1976, 69070
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 FF



248,340
ORNAMENTAL STANDARD
Charles Eugene Miller, 51964 Fir Rd., Granger, Ind. 46530
Filed May 24, 1976, Ser. No. 689,469
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 A

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PATENTS WERE ISSUED ON THE 27TH DAY OF JUNE, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Ulch, Bryan D., 4,097,727, Cl. 235-382.000.

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Horrom, Bruce Wayne; Minard, Frederick Nelson; and Zaugg, Harold Elmer, 4,097,597, Cl. 424-250.000.
Nara, Takashi; Okachi, Ryo; Yamamoto, Mitsuyoshi; Mori, Yasuki; Sato, Moriyuki; Sugimoto, Masahiro; and Shimizu, Yoshiaki, 4,097,428, Cl. 260-345.90R.
Tomioka, Shinji; and Mori, Yasuki, 4,097,664, Cl. 536-17.000.

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Acda, Petrus Marinus, to Polva Nederland B.V. High-strength pipe coupling. 4,097,070, Cl. 285-86.000.

Adamation, Inc.: *See—*
Perry, Kenneth E., 4,096,664, Cl. 49-235.000.

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Adams, Guy, to Solitron Devices, Inc. Skin conditioning indicator. 4,096,852, Cl. 128-2.00H.

Adams, Stanley B.; Loebbaka, Gregory A.; and Morge, Michael P., to Caterpillar Tractor Co. Valve group subassembly. 4,096,878, Cl. 137-351.000.

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Agarwal, Mahesh C.; and Dadson, Joseph E. Apparatus for peritoneal dialysis. 4,096,859, Cl. 128-213.000.

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Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan Martinov; Pascault, Jean-Pierre; Pham, Quang Tho; Pillot, Christian; and Salle, Robert, 4,097,660, Cl. 526-173.000.

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De Roeck, Joseph Irma; and Christiaen, Lucien Antoine, 4,097,323, Cl. 156-159.000.

Ahmed, Nazeer; and Histand, Ivan Gerald, to Western Electric Company, Inc. Hydrostatic extrusion methods and apparatus. 4,096,721, Cl. 72-60.000.

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Aitken, Thomas; and Pote, Wilfred D., to Nalco Chemical Company. Cationization of starch utilizing alkali metal hydroxide, cationic water-soluble polymer and oxidant for improved wet end strength. 4,097,427, Cl. 260-9.000.

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Akiyama, Keiichi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujii, Takara, to Toshiba Chemical Products Co. Ltd. Heat-resistant thermosetting polyimide resin with bis-phenol-epichlorohydria reaction product. 4,097,545, Cl. 260-830.00P.

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Roskott, Lodewijk; and Schroeder, Arnold, 4,097,467, Cl. 260-75.0UA.

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Hartigan, Richard Joseph, Jr., 4,097,652, Cl. 428-401.000.

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James, Leonard Evans; Balint, Laszlo Joseph; and Lazarus, Stanley David, 4,097,468, Cl. 260-75.00M.
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Long, E. David, 4,096,830, Cl. 123-32.0EA.
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Allinikov, Sidney, to United States of America, Air Force. Coated electroluminescent phosphors. 4,097,776, Cl. 313-502.000.

Allis-Chalmers Corporation: *See—*
Burrus, Joe H., Jr., 4,097,794, Cl. 324-54.000.

Allmer, Franz, to Graystone Corporation. Track tamper with hingeable unitary pivotable tamping unit. 4,096,806, Cl. 104-12.000.

Allred, John Caldwell. High speed particle sorter using a field emission electrode. 4,097,373, Cl. 209-111.500.

Alphonse, Gerard Argant, to RCA Corporation. Variable acoustic wave energy transfer-characteristic control device. 4,096,756, Cl. 73-609.000.

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Harvey, John K., Jr.; Watson, Morris T.; Economy, Constantine F.; and LeFevre, Robert J., 4,096,893, Cl. 141-90.000.
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American Home Products Corporation: *See—*
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AMP Incorporated: *See—*
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Amselem, Armand, to Centre d'Etudes Pour L'Industrie Pharmaceutique. 5-o-Cyanobenzyl-4,5,6,7-tetrahydro-thieno[3,2-c]pyridine maleate. 4,097,482, Cl. 260-294.80C.

Ancker, Per. Ski boot. 4,096,651, Cl. 36-120.000.

Anderka, Gerold; Hampel, Horst; Jozat, Walter; and Straszewski, Klaus, to Mesne Koh-I-Noor Rapidograph, Inc. Blocking assembly for an automatic drafting device. 4,097,874, Cl. 346-140.00R.

Anderson, James B., to United States of America, Energy. Isotope separation process. 4,097,247, Cl. 55-17.000.

Anderson, Joseph. Plant stake including basket. 4,096,662, Cl. 47-70.000.

Anderson, Leroy E.; Schmidt, Michael P.; and Weaver, William W., to Manufacturers Systems, Inc. Apparatus for making corrugated flexible metal tubing. 4,096,720, Cl. 72-50.000.

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Lapple, Walter Christian, 4,097,092, Cl. 302-25.000.
Rosling, Denys Reginald, 4,097,228, Cl. 432-250.000.
Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, to Hoechst Aktiengesellschaft. Novel cyclopentane derivatives. 4,097,496, Cl. 260-345.80P.
Baccaro, Gary P.; and Seitz, James F., to Xerox Corporation. Purification and realloying of arsenic/selenium alloys. 4,097,267, Cl. 75-0.50B.
Bacharowski, Walter, to General Electric Company. Arc discharge lamp including starting circuit. 4,097,777, Cl. 315-60.000.
Bachtold, Jakob H.; and Dahmen, Martin, to Elektromaschinen AG. Oven. 4,097,709, Cl. 219-10.55R.
Backskog, Hans, to Asea AB. Method for maintaining the positioning of electrical elements within a container. 4,096,628, Cl. 29-628.000.
Bacus, James W., to Rush-Presbyterian-St. Luke's Medical Center. Method of and an apparatus for automatic classification of red blood cells. 4,097,845, Cl. 340-146.3CA.
Baertsch, Richard D.; and Tiemann, Jerome J., to General Electric Company. Split electrode structure for semiconductor devices. 4,097,886, Cl. 357-24.000.
Bagrosky, Michael Edward: *See*—
Dulmaine, Joseph Francis; and Bagrosky, Michael Edward, 4,096,814, Cl. 113-120.00M.
Bailey, John V.: *See*—
Cleveland, Thomas H.; and Bailey, John V., 4,097,547, Cl. 260-860.000.
Bain, George W., Jr.; Forgue, Stanley V.; and Morris, Albert G., to RCA Corporation. Infrared sensitive photoconductive pickup tube. 4,097,775, Cl. 313-388.000.
Baiocchi, Leandro, to Aziende Chimiche Riunite Angelini Francesco A.C.R.A.F. S.p.A. Synthesis of m-benzoyl-hydratropic acid. 4,097,522, Cl. 260-517.000.
Baits, Stephen S., to Sundstrand Corporation. Self-pressurization system for gearboxes and the like. 4,097,200, Cl. 417-302.000.
Baka Manufacturing Company, Inc.: *See*—
Kaplan, David; Brezack, Irving; Young, Nathan H., deceased; Kaplan, David, executor; Brezack, Irving, executor; and Wapner, Herbert H., 4,096,863, Cl. 128-349.00R.
Baker International Corporation: *See*—
Kenneday, John W.; Kinney, Charles W.; Scott, Floyd L., Jr.; and Schmuck, Phillip W., 4,096,913, Cl. 166-290.000.
Bakul, Valentin Nikolaevich; Bilyk, Igor Ivanovich; Bronshtein, Dolores Khaimovna; Vovchanovsky, Ivan Fedorovich; and Tsypin, Nekhemian Veniaminovich. Method of making superhard articles. 4,097,274, Cl. 75-201.000.
Balbas, Frank M.: *See*—
Chou, Albert S.; and Balbas, Frank M., 4,097,908, Cl. 360-76.000.
Balding, George H. Video color film analyzer. 4,097,892, Cl. 358-80.000.
Balducci, Luigi; Sarti, Dino; and Gerelli, Fausto, to Montedison S.p.A. Inorganic pigments and process for preparing same. 4,097,300, Cl. 106-299.000.
Balint, Laszlo Joseph: *See*—
James, Leonard Evans; Balint, Laszlo Joseph; and Lazarus, Stanley David, 4,097,468, Cl. 260-75.00M.
Ballard, James P.: *See*—
Seligman, Lawrence; Ballard, James P.; and Jeffery, Edwin A., 4,097,729, Cl. 235-467.000.
Ban, Kazuhiro: *See*—
Endo, Hiroshi; and Ban, Kazuhiro, 4,097,864, Cl. 343-7.0VM.
Banerjee, Bani Ranjan, to Ingersoll-Rand Company. Roller shell hard coating. 4,097,711, Cl. 219-76.150.
Banitt, Elden H.; and Coyne, William E., to Riker Laboratories, Inc. Tertiary amide derivatives of pyrrolidine and piperidine. 4,097,481, Cl. 260-293.770.
Banner Metals Division of Intercole automation, Inc.: *See*—
Hosko, Robert M., 4,097,097, Cl. 312-250.000.
Barack, William N.; Gay, Charles H., Jr.; Beekman, Stephen W.; and Domas, Paul A., to United States of America, National Aeronautics and Space Administration. Redundant disc. 4,097,194, Cl. 416-244.00A.
Barch, Herbert W.; and Bohy, August G., to PPG Industries, Inc. Method and apparatus for producing slubby yarn. 4,096,685, Cl. 57-34.00B.
Barcza, Sandor; and Hendrickson, James B., to Sandoz, Inc. 2,4-Disubstituted-4b,5,6,7,8,8a,9,10-octahydro-9-oxo-phenanthrenes. 4,097,609, Cl. 424-331.000.
Barie, Walter P., Jr., to Gulf Research & Development Company. Preparation of acetylene-substituted polyimide oligomers and polyimide polymers. 4,097,456, Cl. 260-47.0UA.
Barker, Robert I.; and King, David P., to Monsanto Company. Processability tester. 4,096,739, Cl. 73-56.000.
Barlow, Craig B.: *See*—
Chou, Eddie C. J.; Barlow, Craig B.; and Huggins, Dale K., 4,097,575, Cl. 423-150.000.
Barnes, Franklin K., to Boeing Company, The. Aircraft ramp door. 4,097,009, Cl. 244-129.500.
Baron, Arthur L.: *See*—
Rawlings, Herbert L.; and Baron, Arthur L., 4,097,435, Cl. 260-28.00R.
Barone, Bruno J.; and Kerr, Ralph O., to Denka Chemical Corporation. Process for preparing maleic anhydride from C_4 hydrocarbons. 4,097,498, Cl. 260-346.750.
Barry, James Robert. Learn-to-dress manual. 4,096,647, Cl. 35-56.000.
Bartels, Hermann; Gallati, Fritz; Lang, Karl; and Rutishauser, Heinz, to Mettler Instrumente AG. Apparatus for the selective delivery of portions of a fluid medium. 4,096,972, Cl. 222-135.000.
Barthel, Gerhard. Rupture-preventing air-releasing water-freezing reservoir. 4,096,709, Cl. 62-307.000.
Bartholic, David B., to UOP Inc. Hydrocarbon-feed distributor of injecting hydrocarbon feed. 4,097,243, Cl. 23-288.00S.
Bartmann, Wilhelm: *See*—
Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 4,097,496, Cl. 260-345.80P.
Bartolini, Robert Alfred: *See*—
Neil, Clyde Carl; Hammer, Jacob Meyer; and Bartolini, Robert Alfred, 4,097,117, Cl. 350-96.170.
Barville, George W.; and Peterson, Joel R., Sr. Device for anchoring bottles or the like, and method. 4,096,977, Cl. 224-5.0BC.
BASF Aktiengesellschaft: *See*—
Merkle, Hans; and Mueller, Albrecht, 4,097,521, Cl. 260-513.600.
BASF Wyandotte Corporation: *See*—
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,097,399, Cl. 252-182.000.
Musolf, Thomas Carl; and Wyman, Harold Thomas, 4,096,742, Cl. 73-94.000.
Basile, Sebastian B. Warning device and receptacle adaptor. 4,097,843, Cl. 340-280.000.
Bassist, Rudolph G. Method of knitting a velour fabric. 4,096,610, Cl. 28-159.000.
Bauer, Jack N.: *See*—
DiGiulio, Adolph V.; and Bauer, Jack N., 4,097,551, Cl. 260-876.00B.
Bauer, Kurt: *See*—
Rupp, Roland; Schnoring, Hildegard; Schellmann, Erhard; and Bauer, Kurt, 4,096,738, Cl. 73-52.000.
Bauman, Robert Andrew, to Colgate Palmolive Company. Pharmaceutical composition containing quaternary ammonium compounds. 4,097,600, Cl. 424-267.000.
Baurle, Herbert F.: *See*—
Frost, William F.; Masak, Raymond J.; Baurle, Herbert F.; and Kowalski, Anthony F., 4,097,866, Cl. 343-100.0LE.
Baxter Travenol Laboratories, Inc.: *See*—
Cammarata, Frank, III, 4,096,897, Cl. 150-0.500.
Bayer Aktiengesellschaft: *See*—
Burkhardt, Claus; Meyer, Karl-Heinrich; and Weirauch, Kurt, 4,097,455, Cl. 260-47.0CB.
Dieterich, Dieter, 4,097,423, Cl. 260-2.5AK.
Elghani, Salah Elabd; Fischer, Winfried; and Prinz, Richard, 4,097,429, Cl. 260-17.00R.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,097,592, Cl. 424-200.000.
Immel, Otto; Schwarz, Hans-Helmut; and Weissel, Oskar, 4,097,540, Cl. 568-862.000.
Lessnig, Werner; Metz, Gunter; Spiegel, Willi; and Fleischer, Jurgen, 4,096,965, Cl. 220-20.000.
Markusch, Peter, 4,097,422, Cl. 260-2.5AK.
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Homeyer, Bernhard, 4,097,593, Cl. 424-200.000.
Reisdorff, Josef Helmut; Brandes, Wilhelm; Scheinpflug, Hans; Homeyer, Bernhard; and Roessler, Peter, 4,097,669, Cl. 542-413.000.
Rupp, Roland; Schnoring, Hildegard; Schellmann, Erhard; and Bauer, Kurt, 4,096,738, Cl. 73-52.000.
von Bonin, Wulf, 4,097,385, Cl. 428-35.000.
BBC Brown, Boveri & Company, Limited: *See*—
Henke, Arno, 4,097,036, Cl. 269-254.00R.

Beatrice Foods Co.: *See—*
Millar, John M., 4,097,639, Cl. 428-215.000.

Becht, Balazs: *See—*
Tanner, James L.; Rist, Bruno A.; Sanchez, George; and Becht, Balazs, 4,097,894, Cl. 358-118.000.

Bechtel International Corporation: *See—*
Namikas, Daumantas; and Kuwabara, Takao, 4,097,183, Cl. 415-1.000.

Bechtel, Russell D., to Raymond Lee Organization, Inc., The, a part interest. Bowling ramp. 4,097,045, Cl. 273-54.00R.

Beck, Gerhard: *See—*
Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 4,097,496, Cl. 260-345.80P.

Becker, Wolfgang: *See—*
Wallwey, Erich; Becker, Wolfgang; and Heldmann, Heinrich, 4,096,783, Cl. 89-34.000.

Beckman Instruments, Inc.: *See—*
Pierre, Kenneth J.; Tung, Ker-Kong; and Nadj, Henriette, 4,097,336, Cl. 195-99.000.

Beckwith, Sterling. Free condensing liquid retro-pumping refrigerator system and method. 4,096,706, Cl. 62-115.000.

Becton, Dickinson and Company: *See—*
Riuli, Arduino E.; and Kopacz, Bernard F., 4,096,962, Cl. 215-32.000.

Becuwe, Alain G.; Senet, Jean-Pierre G.; and Ucciani, Claude M., to Societe Nationale des Poudres et Explosifs. Process for the preparation of 2-fluoro-2,2-dinitroethyl isocyanate. 4,097,513, Cl. 260-453.0PH.

Beecham Group Limited: *See—*
Gardner, Derek Victor, 4,097,480, Cl. 260-286.00R.

Beekman, Stephen W.: *See—*
Barack, William N.; Gay, Charles H., Jr.; Beekman, Stephen W.; and Domas, Paul A., 4,097,194, Cl. 416-244.00A.

Begany, Albert J.; Rosenthale, Marvin E.; and Dervinis, Alphonse, to American Home Products Corporation. Inhalation therapy for relieving bronchial spasm using quaternary salts of promethazine. 4,097,596, Cl. 424-247.000.

Beggs, James Ingram; Langlitz, Karlheinz; Schmitz, Gunter; and Jansa, Wolfgang, to Demag Aktiengesellschaft. Metallurgical vat support system. 4,096,918, Cl. 177-145.000.

Behr, Joseph L., to Emerson Electric Co. Compensated control valve. 4,096,993, Cl. 236-68.00B.

Behrenz, Wolfgang: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,097,592, Cl. 424-200.000.

Beilein, Loraine F.; and Burkett, Frank S., Jr., to E-Systems, Inc. Bonding copper leads to gold film coatings on alumina ceramic substrate. 4,096,983, Cl. 228-122.000.

Belanger, James A. Friction curtain apparatus. 4,096,600, Cl. 15-97.00B.

Bell & Howell Company: *See—*
Kim, Raymond W. H.; Klein, Robert A.; Lodge, Edward H.; Lueders, Arthur L.; and Woodier, James G., 4,097,132, Cl. 352-242.000.

Bell-Matic A/S: *See—*
Poulsen, Freddy; and Poulsen, Robert Edvin, 4,097,048, Cl. 273-143.00R.

Bell Telephone Laboratories, Incorporated: *See—*
Ngo, Peter Dinh-Tuan, 4,097,780, Cl. 315-169.0TV.

Bellavance, David W., to Texas Instruments Incorporated. Semiconductor laser. 4,097,819, Cl. 331-94.50H.

Bendix Corporation, The: *See—*
Gunda, Rajamouli, 4,096,831, Cl. 123-32.0EG.
Sweet, Charles R., 4,096,833, Cl. 123-32.0EA.
Tawfik, David A., 4,096,989, Cl. 235-307.000.

Benko, Pal; Simonek, Ildiko; Pallos, Laszlo; Kovacs, Jeno; and Magyar, Karoly, to Egyt Gyogyszervegyeszeti Gyar. 2-[(p-Methoxy-benzoyl)-hydrazono-formyl]-quinoxaline-1,4-dioxide. 4,097,668, Cl. 542-418.000.

Bennett, Geoffrey Richard: *See—*
Jones, Norman Stewart; and Bennett, Geoffrey Richard, 4,096,875, Cl. 137-102.000.

Bennett, James G.; and Cooper, Glenn D., to General Electric Company. Method for preparing polyphenylene ethers. 4,097,458, Cl. 260-47.0ET.

Bennett, James G.; and Cooper, Glenn D., to General Electric Company. Method for preparing polyphenylene ethers. 4,097,459, Cl. 260-47.0ET.

Benson, James A.: *See—*
Smith, David B.; and Benson, James A., 4,096,856, Cl. 128-4.19D.

Benyon, Carl William, Jr.: *See—*
Schlesier, Kenneth Mansfield; Benyon, Carl William, Jr.; and Shaw, Joseph Michael, 4,097,314, Cl. 148-188.000.

Berg, Eldon Carl: *See—*
Olson, David Harmon; and Berg, Eldon Carl, 4,097,798, Cl. 324-78.00D.

Berger, Abe, to General Electric Company. Organofunctional-silicon materials. 4,097,511, Cl. 260-448.20N.

Berger, Dieter, to Chemische Werke Huels Aktiengesellschaft. Liquid coating compositions. 4,097,465, Cl. 260-75.0EP.

Berger, Dieter, to Chemische Werke Huels Aktiengesellschaft. Liquid coating compositions. 4,097,466, Cl. 260-75.0EP.

Berger, Leo; and Schmidt, Robert August, to Hoffmann-La Roche Inc. Amides of 2-(3-dibenzofuran) alkanoic acids. 4,097,497, Cl. 260-346.710.

Berger, Richard E.; and Wahrenburg, Herbert L., to Caterpillar Tractor Co. Method of concurrently rotating a threaded fastener and deflecting a locking tab. 4,096,621, Cl. 29-526.00R.

Bergh, Eugene H., to Minnesota Mining and Manufacturing Company. Thermoplastic resin molding of complex decorative relief. 4,097,634, Cl. 428-156.000.

Berkowitz, Ami E.; Lahut, Joseph A.; and Wang, Jish Min, to General Electric Company. Transverse recording head for magnetic printing. 4,097,871, Cl. 346-74.100.

Berluti, Vincent, Jr.: *See—*
Shapiro, Jonathan S.; Berluti, Vincent, Jr.; Pellegrino, Anthony; and Wagner, Howard G., 4,097,793, Cl. 324-20.00R.

Berthelon, Jean-Jacques: *See—*
Briet, Philippe; Berthelon, Jean-Jacques; Depin, Jean-Claude; and Boschetti, Eugene, 4,097,582, Cl. 424-283.000.

Bertin, Michael C.; Hicksted, Richard L.; and Mitsuhashi, James M., to Nucleonics Data Systems. Extrusion line control system. 4,097,566, Cl. 264-40.700.

Bertozzi, Eugene Ribello, to Thiokol Corporation. Elemental sulfur having improved impact resistance. 4,097,299, Cl. 106-287.320.

Bessho, Hironori: *See—*
Nohira, Hidetaka; Bessho, Hironori; and Sakai, Yasuyuki, 4,096.691, Cl. 60-295.000.

Betten, Paul R., to United States of America, Energy. Coolant mass flow equalizer for nuclear fuel. 4,097,331, Cl. 176-81.000.

Betz Laboratories, Inc.: *See—*
Schell, Charles E.; Deegan, Dennis C.; and Jacques, Donald F., 4,097,341, Cl. 204-1.00T.

Beveridge, Wendell Hazelton, Jr.; and Van Over, William Edward, to Du Pont de Nemours, E. I., and Company. Removable probe. 4,096,754, Cl. 73-432.00R.

Beyer, Edward Robert: *See—*
Ehrlich, Stephen Jeffrey; and Beyer, Edward Robert, 4,097,691, Cl. 179-2.00C.

Bezold, Helmut, to Kraftwerk Union Aktiengesellschaft. Method of joining nuclear fuel rod end caps and nuclear fuel rod cladding tubes. 4,097,712, Cl. 219-107.000.

Bianchi, Nereo, to NECCHI Societa per Azioni. Device for varying the pocket length provided on sewing machines for making welted pockets. 4,096,810, Cl. 112-65.000.

BICC Limited: *See—*
Greene, David James; and Pearson, Colin Alfred, 4,097,322, Cl. 156-149.000.

Bickel, Samuel H., to Texas Instruments Incorporated. Solid state microwave oven power source. 4,097,708, Cl. 219-10.55R.

Bicking, John B.: *See—*
Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., 4,097,504, Cl. 260-405.000.

Bickmore, Inc.: *See—*
Chiesa, Peter J., Jr.; and Ott, Meredith S., 4,097,305, Cl. 134-6.000.

Bier, Gerhard: *See—*
Buning, Robert; and Bier, Gerhard, 4,097,436, Cl. 260-29.60H.

Bilbert, Paul; and Rossner, Ewald, to Alexander Wiegand GmbH u. Co., Armaturen- u.Manometerfabrik. Pressure gauge. 4,096,760, Cl. 73-738.000.

Biles, Alfred. Rotary fluid pressure engine. 4,096,846, Cl. 123-228.000.

Bilsbury, Stephen J., to United States of America, Air Force. Plastic/-mischmetal incendiary projectile. 4,096,804, Cl. 102-66.000.

Bilyk, Igor Ivanovich: *See—*
Bakul, Valentin Nikolaevich; Bilyk, Igor Ivanovich; Bronshtein, Dolores Khaimovna; Vovchanovsky, Ivan Fedorovich; and Tsypin, Nekhemian Veniaminovich, 4,097,274, Cl. 75-201.000.

Bio-Medicus, Inc.: *See—*
Kletschka, Harold D.; and Rafferty, Edson D., 4,096,864, Cl. 128-354.000.

Biological Developments, Inc.: *See—*
Gross, Stanley Joseph, 4,097,586, Cl. 424-1.000.

Birker, Bertel: *See—*
Olsen, Gunnar Ernst Rudolf; Iversen, Poul Christian Carlos; and Birker, Bertel, 4,097,719, Cl. 219-364.000.

Bish, James R.: *See —*
Eshelman, Larry J.; and Bish, James R., 4,096,724, Cl. 72-132.000.

Bissonette, Vernon L., to Eastman Kodak Company. Redox amplification process employing a combination of oxidizing agents. 4,097,278, Cl. 96-22.000.

Bivens, Ward L.; and Schwehr, Richard A., to Towmotor Corporation. Delayed turn-on and turn-off control circuit. 4,097,791, Cl. 318-484.000.

Black Clawson Company, The: *See—*
Cruea, Ronald DeWayne, 4,097,382, Cl. 210-456.000.

Black, Sigmund; and Finney, James L., to United States of America, Interior. Sensing mechanism for mine roof bolting apparatus. 4,097,854, Cl. 340-282.000.

Blackmer, David E.; and Jaeger, C. Rene, to DBX, Incorporated. Operational rectifier. 4,097,767, Cl. 307-229.000.

Blaine, Benjamin F.: *See—*
Dole, James R.; and Blaine, Benjamin F., 4,097,199, Cl. 417-286.000.

Blakeway, Douglas Hayward, to Blakeway Industries Ltd. Carburetor. 4,097,562, Cl. 261-41.00B.

Blakeway Industries Ltd.: *See—*
Blakeway, Douglas Hayward, 4,097,562, Cl. 261-41.00B.

Bledsoe, James O., Jr.; and Johnson, Walter E., Jr., to SCM Corpora-

tion. Substituted cyclopropane process and product. 4,097,531, Cl. 260-586.00R.

Bleicher, Manfred: *See*—
Wanner, Karl; Reibetanz, Wilbert; Bleicher, Manfred; and Wiesner, Herbert, 4,097,176, Cl. 408-56.000.

Bleijerveld, Hendrik Cornelis: *See*—
Brands, Antoon Hendrikus; Gietema, Jouke; and Bleijerveld, Hendrik Cornelis, 4,097,848, Cl. 365-118.000.

Blessinger, James Edward, to Kimball International, Inc. Saw guard. 4,096,789, Cl. 83-478.000.

Bliault, Alan Edgar John: *See*—
Adamson, Stewart Marr; and Bliault, Alan Edgar John, 4,096,704, Cl. 61-95.000.

Blount, David H. Process for the production of poly(urethane silicate) resin and foams. 4,097,424, Cl. 260-2.50A.

Bobrick, Mitchell; Quin, Murray L.; and Buzan, Morris M., to Emerson Electric Co. Illumination system. 4,097,919, Cl. 362-270.000.

Bock, Kurt; and Flohr, Georg. Process and machine for production of braided packing. 4,096,781, Cl. 87-28.000.

Bodine, Albert G. Torsional sonic oscillator employing universal joints and tandem arranged oscillator rotors. 4,096,762, Cl. 74-61.000.

Boeing Company, The: *See*—
Barnes, Franklin K., 4,097,009, Cl. 244-129.500.
Hause, Leroy Robert; and Coplin, Clarence William, 4,096,755, Cl. 73-598.000.
Horne, William E., 4,097,309, Cl. 136-89.0PC.
Lunden, Clarence D., 4,097,796, Cl. 324-58.00B.

Bohy, August G.: *See*—
Barch, Herbert W.; and Bohy, August G., 4,096,685, Cl. 57-34.00B.

Bonnamour, Yves Bernard, to Southwire Company. Casting machine with multi-band positioning device. 4,096,906, Cl. 164-433.000.

Bonne, Claude: *See*—
Perronnet, Jacques; Girault, Pierre; and Bonne, Claude, 4,097,578, Cl. 424-273.00R.

Bordat, Andre Jules Edmond, to Societe Nationale Industrielle Aerospatiale. Supporting foil for a hydrofoil comprising at least one deformable part. 4,096,817, Cl. 114-280.000.

Borowick, John Joseph, to United States of America, Army. Antenna for combined surveillance and foliage penetration radar. 4,097,868, Cl. 343-727.000.

Borsheim, Lewis A., to Melroe Industries, Inc. Powered contaminant discharge evacuator in connection with air cleaner. 4,097,256, Cl. 55-429.000.

Bosch, Peter N.: *See*—
Glecker, Donald Leroy; Roth, John F.; and Bosch, Peter N., 4,096,728, Cl. 72-345.000.

Boschetti, Eugene: *See*—
Briet, Philippe; Berthelon, Jean-Jacques; Depin, Jean-Claude; and Boschetti, Eugene, 4,097,582, Cl. 424-283.000.

Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Electrodeposition of compositions containing sulfonium resins and capped polyisocyanates. 4,097,352, Cl. 204-181.00C.

Botros, Raouf, to American Color & Chemical Corporation. Metal-containing polypropylene dyed with monoazo 1-aryl-3-alkyl-5-pyrazolones. 4,097,231, Cl. 8-41.00D.

Boundy, Bruce K., to Westinghouse Electric Corp. Combination support bracket and self-adjusting wedge. 4,097,014, Cl. 248-225.400.

Bowles, Vernon O. Solar heat collection. 4,096,861, Cl. 126-271.000.

Box Innards, Inc.: *See*—
Peters, Charles Luther, Jr., 4,096,767, Cl. 74-822.000.

Brackbill, Warren H.; and Ostergren, William F., to Sperry Rand Corporation. Detachable wear plate for a flail-type material spreader. 4,097,001, Cl. 239-658.000.

Brandes, Wilhelm: *See*—
Reisdorff, Josef Helmut; Brandes, Wilhelm; Scheinpflug, Hans; Homeyer, Bernhard; and Roessler, Peter, 4,097,669, Cl. 542-413.000.

Brands, Antoon Hendrikus; Gietema, Jouke; and Bleijerveld, Hendrik Cornelis, to Hollandse Signaalapparaten B.V. Readout unit for data stored in a random-access memory and presented on a raster scan display in accordance with a given line pattern. 4,097,848, Cl. 365-118.000.

Brandt, Joachim: *See*—
Kirchhoff, Franz-Josef; and Brandt, Joachim, 4,097,252, Cl. 55-135.000.

Brauer, Harald Otto Christian; Jensen, Knud Sejr; Andreasen, Torben; Jensen, Hilmer; Greve, Mogens; and Kurstein, Peter, to Scanglas A/S. Method of manufacturing a double glass panel unit. 4,097,320, Cl. 156-109.000.

Braun Aktiengesellschaft: *See*—
Weise, Hans Joachim, 4,097,718, Cl. 219-222.000.

Braunschweigische Maschinenbauanstalt: *See*—
Korsch, Helmut, 4,097,303, Cl. 127-19.000.

Brax, Jean Albert, to Saint Gobain Industries. Feeder conduits for a glass furnace with heating electrodes. 4,097,259, Cl. 65-327.000.

Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. Carboxyalkylureido cephalosporins. 4,097,670, Cl. 544-27.000.

Breuninger, Karl; Haberland, Detlef; and Herberger, Roland, to Siemens Aktiengesellschaft. Discrete crossover chips for individual conductor track crossovers in hybrid circuits and method for constructing same. 4,097,685, Cl. 174-68.500.

Brewer, Arthur D.; and Davis, Robert A., to Uniroyal, Inc.; and Uniroyal Ltd. 2,3-Dihydro-1,4-dithiin 1,1,4,4-tetroxide antimicrobials. 4,097,580, Cl. 424-277.000.

Brewer, Robert W., Jr.: *See*—
Collins, Walter W., 4,096,979, Cl. 224-26.00B.

Brezack, Irving: *See*—
Kaplan, David; Brezack, Irving; Young, Nathan H., deceased; Kaplan, David, executor; Brezack, Irving, executor; and Wapner, Herbert H., 4,096,863, Cl. 128-349.00R.

Brezack, Irving, executor: *See*—
Kaplan, David; Brezack, Irving; Young, Nathan H., deceased; Kaplan, David, executor; Brezack, Irving, executor; and Wapner, Herbert H., 4,096,863, Cl. 128-349.00R.

Brezinski, Donald P., to Corning Glass Works. Testing the operation of a recording fluorometer/densitometer. 4,097,735, Cl. 250-252.000.

Brezinski, Richard R.: *See*—
Goodrich, Stanley R., Jr.; Skolnik, David J.; Stearns, Joseph A.; Farrell, Robert C.; Brezinski, Richard R.; and Parks, Robert R., 4,097,057, Cl. 280-96.100.

Bridgestone Tire Co., Ltd.: *See*—
Kitazawa, Yoichi; Sato, Takeshi; and Tsuji, Hisao, 4,096,899, Cl. 152-354.00R.
Muramatsu, Tateo; Fukai, Toshio; and Takahashi, Haruo, 4,096,700, Cl. 61-1.00F.

Bridon Limited: *See*—
Campbell, Robert Edward, 4,097,164, Cl. 403-284.000.

Briet, Philippe; Berthelon, Jean-Jacques; Depin, Jean-Claude; and Boschetti, Eugene, to Lipha, Lyonnaise Industrielle Pharmaceutique. 6',2-(2'-Arylchromonyl) propionic acids, and analgesic and anti-inflammatory derivatives thereof. 4,097,582, Cl. 424-283.000.

Brionne, Yves, to Legrand S.A. Acoustic warning device, in particular a bell. 4,097,862, Cl. 340-396.000.

Bristol-Myers Company: *See*—
Chavkin, Leonard; and Merkle, F. Henry, 4,097,606, Cl. 424-324.000.

British Petroleum Company Limited, The: *See*—
Faulkner, Philip George, 4,096,815, Cl. 113-120.00A.
Speakman, John Gabriel, 4,097,409, Cl. 252-429.00R.

British Steel Corporation: *See*—
Taylor, George, 4,097,304, Cl. 134-6.000.

Britt, A. D.: *See*—
Schnur, Joel M.; Miller, Richard S.; Sheridan, James P.; and Britt, A. D., 4,097,317, Cl. 149-7.000.

Brock, James A., to Aerovent, Inc. Air moving device with oil fired heating apparatus. 4,097,227, Cl. 432-187.000.

Bronshtein, Dolores Khaimovna: *See*—
Bakul, Valentin Nikolaevich; Bilyk, Igor Ivanovich; Bronshtein, Dolores Khaimovna; Vovchanovsky, Ivan Fedorovich; and Tsypin, Nekhemian Veniaminovich, 4,097,274, Cl. 75-201.000.

Brook, Richard Morley, to AutoSystems Limited. Sorting systems and sensing devices for use therewith. 4,096,950, Cl. 209-121.000.

Broome, Michael D., to Draper Shade and Screen Co. Tripod stand for projection screen. 4,097,013, Cl. 248-171.000.

Brown, Allen C.: *See*—
Eyrick, Theodore B.; Brown, Allen C.; and Hattes, Neil R., 4,096,858, Cl. 128-145.600.

Brown, David, to Osro Limited. Rotary seals. 4,096,666, Cl. 51-7.000.

Brown, Jerald: *See*—
Negola, Edward J.; and Brown, Jerald, 4,097,232, Cl. 8-65.000.

Brown, Keith E., to Addressograph-Multigraph Corporation. Apparatus and method for incrementally rotating a shaft. 4,096,761, Cl. 74-128.000.

Brown, Robert Warren, to Xerox Corporation. Process for providing encapsulated toner composition. 4,097,404, Cl. 252-316.000.

Brunetti, Heimo: *See*—
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,097,587, Cl. 260-45.80A.

Brungard, Alvin J.; Galloway, Richard M.; and Kerwick, Donald P., to General Electric Company. Method and apparatus for removing stator vanes. 4,096,614, Cl. 29-156.80R.

Brunsch, Klaus; and Weiland, Emil, to Messerschmitt-Boelkow-Blohm GmbH. Elastomeric damping arrangement. 4,097,193, Cl. 416-224.000.

Bryson, John D., to Will Ross, Inc. Manual deodorizer dispenser. 4,096,994, Cl. 239-57.000.

Bubb, Gary E.: *See*—
Kuchmas, John, Jr.; and Bubb, Gary E., 4,097,800, Cl. 324-178.000.

Buchanan, Vernon G.; and Rhoades, Carl E., to Microfilm Service Corporation. Step-and-repeat camera. 4,097,143, Cl. 355-53.000.

Buck, Charles E.: *See*—
Huntzinger, Gerald O.; Buck, Charles E.; and Campbell, Robert E., 4,096,735, Cl. 73-35.000.

Buckler, Robert Thomas, to Miles Laboratories, Inc. 5,6-Benzo analogues of prostaglandin E. 4,097,516, Cl. 260-465.00F.

Buckner, Walter E., to Lucky Manufacturing Company. Gondola car loader. 4,096,954, Cl. 214-38.0CC.

Budd Company, The: *See*—
Dean, Albert G., 4,097,063, Cl. 280-712.000.

Budris, Allan R., to Worthington Pump, Inc. Multi-stage ring type centrifugal pumps with inducer means. 4,097,186, Cl. 415-143.000.

Buendia, Jean; and Schalbar, Jeanine, to Roussel Uclaf. Novel cyclopentanones. 4,097,494, Cl. 260-345.80P.

Buergel, Georg Karl. Heating chamber seal provided in a heating chamber combustion engine. 4,096,689, Cl. 60-39.630.

Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9α,6-nitrilo or 6,9α-imino-PGF compounds. 4,097,489, Cl. 260-326.270.

Bundy, Gordon L., to Upjohn Company, The. Cis-13-9-deoxy-PGF_2 Analogs. 4,097,505, Cl. 260-413.000.

Bundy, Gordon L., to Upjohn Company, The. Cis-13,9-deoxy-PGF_1 compounds. 4,097,506, Cl. 260-413.000.

Bundy, Gordon L., to Upjohn Company, The. Cis-4,5-didehydro-13,14 dihydro-9, dioxy PGF compounds. 4,097,508, Cl. 260-413.000.

Buning, Robert; and Bier, Gerhard, to Dynamit Nobel Aktiengesellschaft. Hydrolyzed vinyl acetate-vinyl alkoxy silane polymers. 4,097,436, Cl. 260-29.60H.

Bunker Ramo Corporation: *See*—
Furey, Robert J.; and Stupay, Lawrence J., 4,097,104, Cl. 339-74.00R.

Burcz, John F.: *See*—
Krause, Thomas R.; Paananen, Eugene E.; and Burcz, John F., 4,097,731, Cl. 250-205.000.
Krause, Thomas R.; Paananen, Eugene E.; and Burcz, John F., 4,097,732, Cl. 250-205.000.

Burd, Inc., Howell Division: *See*—
Petersen, Warren D., 4,097,089, Cl. 297-447.000.

Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., to Atlantic Richfield Company. Process for removing sulfur from coal. 4,097,244, Cl. 44-1.00R.

Burkett, Frank S., Jr.: *See*—
Beilein, Loraine F.; and Burkett, Frank S., Jr., 4,096,983, Cl. 228-122.000.

Burkhardt, Claus; Meyer, Karl-Heinrich; and Weirauch, Kurt, to Bayer Aktiengesellschaft. Moulding compositions of mixtures of halogen-containing and halogen-free polyfunctional aromatic cyanic acid esters. 4,097,455, Cl. 260-47.0CB.

Burkhart, Gerald W., to Arco Polymers, Inc. Cold-patching. 4,097,172, Cl. 404-75.000.

Burr, Robert Page, to Kollmorgen Technologies Inc. Electric wiring assemblies. 4,097,684, Cl. 174-68.500.

Burroughs Corporation: *See*—
Finet, Michel, 4,097,797, Cl. 324-73.00R.
Krause, Thomas R.; Paananen, Eugene E.; and Burcz, John F., 4,097,731, Cl. 250-205.000.
Krause, Thomas R.; Paananen, Eugene E.; and Burcz, John F., 4,097,732, Cl. 250-205.000.
Looschen, Floyd William, 4,097,859, Cl. 340-347.0DD.

Burroughs Wellcome Co.: *See*—
Krenitsky, Thomas Anthony; and Bushby, Stanley Robert Morris, 4,097,337, Cl. 195-100.000.

Burroway, Gary L.: *See*—
Maximovich, Michael J.; and Burroway, Gary L., 4,097,440, Cl. 260-31.40R.

Burrus, Joe H., Jr., to Allis-Chalmers Corporation. Static means for detecting ground insulation failure for rotary electric machines. 4,097,794, Cl. 324-54.000.

Burton, John David: *See*—
Selwood, Timothy John; Axtell, Martin John Shelley; Burton, John David; Selwood, Peter Richard, deceased; Selwood, Timothy John, executor; and Axtell, Martin John Shelly, executor, 4,097,203, Cl. 417-480.000.

Burton, Parsons and Company, Inc.: *See*—
Manfuso, John A., Jr., 4,096,870, Cl. 134-28.000.

Burton, Willard J. Mine stopping device and method of constructing same. 4,096,702, Cl. 61-45.00R.

Bushby, Stanley Robert Morris: *See*—
Krenitsky, Thomas Anthony; and Bushby, Stanley Robert Morris, 4,097,337, Cl. 195-100.000.

Butler, William H., Jr. Process and apparatus for mixing and transporting cement. 4,097,925, Cl. 366-2.000.

Buzan, Morris M.: *See*—
Bobrick, Mitchell; Quin, Murray L.; and Buzan, Morris M., 4,097,919, Cl. 362-270.000.

B.V. Neratoom: *See*—
Essebaggers, Jan, 4,096,885, Cl. 138-97.000.

Calaway, Ward Martin, to Lester Electrical of Nebraska, Inc. Battery charger control circuit. 4,097,792, Cl. 320-22.000.

Calemard, Philipe, to Station Service-Textile F. Calemard et Cie S.A. Apparatus to apply vibrations to partially or completely thermofusible articles. 4,097,327, Cl. 156-515.000.

Caley, William F.; and Fiengas, Spero N., to University of Toronto, The Governing Council of the. Preparation of metal alloy coatings on iron substrates. 4,097,351, Cl. 204-181.00N.

Calzaturificio Giuseppe Garbuio S.A.S.: *See*—
Annovi, Giuseppe, 4,096,605, Cl. 24-70.0SK.
Guolo, Giuseppe, 4,096,648, Cl. 36-50.000.

Cammarata, Frank, III, to Baxter Travenol Laboratories, Inc. Molded collapsible solution container having transverse fold lines. 4,096,897, Cl. 150-0.500.

Campbell, Glenn M.: *See*—
Weiss, Verne E.; Campbell, Glenn M.; and Wilson, Gerald L., 4,096,791, Cl. 99-353.000.

Campbell, Robert E.: *See*—
Huntzinger, Gerald O.; Buck, Charles E.; and Campbell, Robert E., 4,096,735, Cl. 73-35.000.

Campbell, Robert Edward, to Bridon Limited. Terminals on wire rope and strand. 4,097,164, Cl. 403-284.000.

Campioni, Armando, to Indesit Industria Elettrodomestici Italiana S.p.A. Amplifying circuit. 4,097,815, Cl. 330-289.000.

Camras, Marvin, to IIT Research Institute. Portable video recording system employing camera and recording stations connected by wireless links. 4,097,893, Cl. 358-83.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Deschenes, Pierre J., 4,096,782, Cl. 89-1.00A.

Canadian General Electric Company Limited: *See*—
Freeman, David Lewis; and Flemons, Ralph Seymour, 4,097,801, Cl. 324-188.000.

Canadian Ingersoll-Rand Co. Ltd.: *See*—
Young, Douglas Leonard, 4,097,374, Cl. 209-379.000.

Canon Kabushiki Kaisha: *See*—
Hanakata, Takayoshi; and Mitaka, Shunji, 4,096,935, Cl. 400-479.000.
Suzuki, Akiyoshi, 4,097,125, Cl. 350-294.000.
Takasu, Yoshio; and Kondo, Eiichi, 4,097,277, Cl. 96-1.50R.
Yataki, Masamichi; Takahata, Hideyo; and Simomura, Norio, 4,097,160, Cl. 356-237.000.

Capital Wire & Cable, Division of U.S. Industries, Inc.: *See*—
Pringle, John Philip, 4,097,648, Cl. 428-326.000.

Carel Fouche Languepin: *See*—
Maillet, Alfred Marie Aime, 4,097,710, Cl. 219-69.00D.

Carey, Charles, to Sanders Associates, Inc. Depolarization measurement by optical heterodyne. 4,097,110, Cl. 350-149.000.

Carlson, George A.; and Jankovsky, William O., to Caterpillar Tractor Co. Dual flex plate drive. 4,096,711, Cl. 64-13.000.

Carlson, Karl, to Scotto, Anthony J. Septic tank-leaching pool arrangement. 4,097,380, Cl. 210-170.000.

Carlson, Roger E., to Moisture Systems Corp. Moisture analyzing method and apparatus. 4,097,743, Cl. 250-339.000.

Carlsson, Gunilla A. Snap fastening device. 4,096,607, Cl. 24-230.0AP.

Carman, Lyle, to Prab Conveyors, Inc. Method of cleaning swarf. 4,097,306, Cl. 134-10.000.

Carter, Ernest Aubert, to Motorola, Inc. MOS switch with hysteresis. 4,097,772, Cl. 307-279.000.

Caspari, Gunter, to Standard Oil Company (Indiana). Olefin-dimercapto-thiadiazole compositions and process. 4,097,387, Cl. 252-47.500.

Cassandrini, Paolo: *See*—
Tozzi, Antonio; and Cassandrini, Paolo, 4,097,454, Cl. 260-45.75N.

Castellano, Paul Eugene. Modular part cart. 4,097,056, Cl. 280-47.350.

Castonguay, Roger N.: *See*—
Jencks, Charles L.; and Castonguay, Roger N., 4,097,831, Cl. 335-166.000.

Castor, Richard R. Apparatus for audio visual presentation of music. 4,097,135, Cl. 353-15.000.

Casull, Don C.; Dalton, James M.; Jackson, Calvin W.; and Jackson, Amos R. Ignition apparatus and method for an internal combustion engine. 4,096,832, Cl. 123-32.0SP.

Caterpillar Tractor Co.: *See*—
Adams, Stanley B.; Loebbaka, Gregory A.; and Morge, Michael P., 4,096,878, Cl. 137-351.000.
Berger, Richard E.; and Wahrenburg, Herbert L., 4,096,621, Cl. 29-526.00R.
Carlson, George A.; and Jankovsky, William O., 4,096,711, Cl. 64-13.000.
Cochran, Thomas E., 4,096,765, Cl. 74-473.00R.
Habiger, Cyril W.; and Hicks, Leon E., 4,096,694, Cl. 60-459.000.
Habiger, Cyril W., 4,097,196, Cl. 417-222.000.
Iverson, Lowell P.; Dirscherl, George W.; and Hagen, Paul D., 4,096,957, Cl. 214-145.00R.
Kaarlela, Willard Oswald; and Helton, Eugene L., 4,096,653, Cl. 37-142.00A.
Ritter, Arthur J., Jr., 4,096,617, Cl. 29-278.000.
Shelby, Robert L.; Duke, James T.; and Parker, Duane L., 4,097,093, Cl. 305-22.000.
Unruh, Dale H., 4,097,060, Cl. 280-492.000.
Whitehurst, Gerald E., 4,096,931, Cl. 192-18.00A.

Cavitt, Stanley B., to Texaco Development Corp. Modified ethylene oxide catalyst and a process for its preparation. 4,097,414, Cl. 252-476.000.

Cebulak, Walter S.; and Weyand, John D., to Aluminum Company of America. Titanium diboride shapes. 4,097,567, Cl. 264-65.000.

Centre d'Etudes Pour L'Industrie Pharmaceutique: *See*—
Amselem, Armand, 4,097,482, Cl. 260-294.80C.

Ceskoslovenska akademie ved: *See*—
Drobnik, Jaroslav; Kopecek, Jindrich; Labsky, Jiri; Rejmanova, Pavla; Exner, Josef; and Kalal, Jaroslav, 4,097,470, Cl. 260-78.00A.
Mikes, Otakar; Strop, Petr; and Coupek, Jiri, 4,097,420, Cl. 260-2.10R.

Chambers, Derek, to Raytheon Company. Marine radar system with independent switched power supplies. 4,097,863, Cl. 343-5.00R.

Chambliss, Hiram Darden. Energy saving means reducing power used by lamps. 4,097,782, Cl. 315-209.00R.

Chan, John Kai-Fai, to Union Carbide Corporation. Preparation of organic sulfone compounds. 4,097,526, Cl. 260-566.0AC.

Chan, Ka-Kong; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Tetramethyl-benzyloxy chromans. 4,097,495, Cl. 260-345.500.

Chang, Tai Ming, to Goodyear Tire & Rubber Company, The. Foamable structural thermoplastic polyester resins. 4,097,421, Cl. 260-2.50N.

Chappelle, Warner A. Automatic semi-trailer landing gear extension and retraction apparatus. 4,097,840, Cl. 340-52.00R.

Charudattan, Raghavan: *See*—
Conway, Kenneth Edward; Freeman, Thomas Edward; and Charudattan, Raghavan, 4,097,261, Cl. 71-66.000.

Chavkin, Leonard; and Merkle, F. Henry, to Bristol-Myers Company. APAP Tablet containing an alkali metal carboxymethylated starch and processes for manufacturing same. 4,097,606, Cl. 424-324.000.

Check, Frank T., Jr.: *See*—
Eckert, Alton B., Jr.; Jones, Howell A., Jr.; and Check, Frank T., Jr., 4,097,923, Cl. 364-900.000.

Checko, John C. Portable sealant applicator. 4,096,973, Cl. 222-146.0HE.
Chemetron Corporation: *See*—
Eyrick, Theodore B.; Brown, Allen C.; and Hattes, Neil R., 4,096,858, Cl. 128-145.600.
Chemische Werke Huels Aktiengesellschaft: *See*—
Berger, Dieter, 4,097,465, Cl. 260-75.0EP.
Berger, Dieter, 4,097,466, Cl. 260-75.0EP.
Schroeder, Manfred; and Schaefer, Wolfgang, 4,097,530, Cl. 260-586.00P.
Chempro Corporation: *See*—
Posey, Dan E.; and Mosier, Benjamin, 4,097,395, Cl. 252-106.000.
Cheng, Jiin-Duey, to Du Pont de Nemours, E. I., and Company. Herbicidal acetamides. 4,097,262, Cl. 71-90.000.
Cheris, Albert B.; and Frye, Lonnie E., to Tenex Corporation. Carpet runner. 4,097,628, Cl. 428-43.000.
Cherne Industrial, Inc.: *See*—
Larson, Richard E., 4,096,997, Cl. 239-413.000.
Chevron Research Company: *See*—
Egan, Clark J., 4,097,364, Cl. 208-111.000.
Kobzina, John W., 4,097,265, Cl. 71-90.000.
Lowe, Warren, 4,097,386, Cl. 252-32.70R.
Chiesa, Peter J., Jr.; and Ott, Meredith S., to Bickmore, Inc. Method for removing bot eggs from animal hair. 4,097,305, Cl. 134-6.000.
Childress, Bobby B.: *See*—
Leitner, Frank W.; and Childress, Bobby B., 4,097,723, Cl. 219-494.000.
Chimkombinat: *See*—
Sendov, Stoyan Hristov; Kuklin, Ivan Alexandrov; Nikolov, Ivan Angelov; Ivanov, Assen Ninov; Mirchev, Mircho Georgiev; and Kurtashev, Radoslav Borissov, 4,097,927, Cl. 366-247.000.
Chimosa Chimica Organica S.p.A.: *See*—
Tozzi, Antonio; and Cassandrini, Paolo, 4,097,454, Cl. 260-45.75N.
Chiyoda Chemical Engineering & Construction: *See*—
Tanaka, Tsunemitsu; Nakagawa, Tetsuo; Abiko, Shiro; and Kaneko, Norio, 4,097,366, Cl. 208-127.000.
Chou, Albert S.; and Balbas, Frank M., to Shugart Associates. Method for inspecting the skew of a magnetic head, for selectively locating a lead screw and an apparatus therefor. 4,097,908, Cl. 360-76.000.
Chou, Eddie C. J.; Barlow, Craig B.; and Huggins, Dale K., to Amax Inc. Roast-neutralization-leach technique for the treatment of laterite ore. 4,097,575, Cl. 423-150.000.
Chown, Martin: *See*—
Selway, Peter Richard; Chown, Martin; Epworth, Richard Edward; Leggett, Norman Derek; and Sunak, Harish Ram Dass, 4,097,891, Cl. 357-81.000.
Christensen, John Mosgaard: *See*—
Curry, Harold George; Attwood, Brian William; White, Derek Graham Walter; Christensen, John Mosgaard; and Kroyer, Karl Kristian Kobs, 4,097,640, Cl. 428-219.000.
Christenson, Roger M.; and Maska, Rudolf, to PPG Industries, Inc. Water-based liners for beverage containers. 4,097,438, Cl. 260-29.4UA.
Christiaen, Lucien Antoine: *See*—
De Roeck, Joseph Irma; and Christiaen, Lucien Antoine, 4,097,323, Cl. 156-159.000.
Chyung, Kenneth; and Wusirika, Raja R., to Corning Glass Works. Silica-alumina-nitrogen containing glasses for production of glass-ceramics. 4,097,295, Cl. 106-52.000.
Ciba-Geigy AG: *See*—
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, 4,097,229, Cl. 8-1.00A.
Ciba-Geigy Corporation: *See*—
Dear, Robert Ernest Arthur; and Falk, Robert Allan, 4,097,642, Cl. 428-262.000.
Farooq, Saleem; and Karrer, Friedrich, 4,097,581, Cl. 424-278.000.
Siegrist, Adolf Emil; and Coviello, Vincenzo, 4,097,515, Cl. 260-465.00G.
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,097,587, Cl. 260-45.80A.
von Zelewsky, Alexander; Frey, Christoph; and L'Eplattenier, Francois, 4,097,484, Cl. 260-299.000.
Wegmuller, Hans; and Haase, Jaroslav, 4,097,376, Cl. 210-36.000.
Cincinnati Milacron-Heald Corp.: *See*—
Uhtenwoldt, Herbert R.; Humes, Norman S.; and Crossman, Richard E., 4,096,667, Cl. 51-99.000.
Cincinnati Milacron Inc.: *See*—
Kellermann, Arnold LeRoy; and McDonald, David Ian, 4,096,953, Cl. 214-1.0BT.
Tanner, Randall Curtis, 4,096,770, Cl. 82-1.00C.
Cinelli, Gabriel: *See*—
Furbee, Avery D.; and Cinelli, Gabriel, 4,097,760, Cl. 313-60.000.
Clardy, Roland: *See*—
Schimming, Fred H., 4,096,638, Cl. 33-396.000.
Clark, Alexander. Composting toilet. 4,096,592, Cl. 4-111.000.
Clark Equipment Company: *See*—
Rocco, Jack O., 4,096,961, Cl. 214-510.000.
Clavell, Cesar, Jr., to United States of America, Navy. Spinning disk electrical isolator for a flowing seawater stream. 4,097,680, Cl. 174-8.000.
Clayton, Russell K., to Eaton Corporation. Tire valve core. 4,097,075, Cl. 285-332.300.
Cleckner, John. Method of increasing the growth of plants grown from seed. 4,096,661, Cl. 47-58.000.
Cleveland, Thomas H.; and Bailey, John V., to Mobay Chemical Corporation. Stabilized polycarbonates. 4,097,547, Cl. 260-860.000.
Cline, Harvey E.: *See*—
Erikson, Carl A.; Fielding, John O.; Cline, Harvey E.; and Anthony, Thomas R., 4,097,226, Cl. 432-120.000.
Cline, Richard L.: *See*—
Kieft, Alvin J.; Cline, Richard L.; and Rabito, Thomas G., 4,097,442, Cl. 260-37.00N.
Close, Ross A. Power head drilling and turning unit. 4,097,177, Cl. 408-132.000.
Clow, William E., to Kimstock, Inc. Universal mounting motorcycle saddlebag bracket. 4,096,980, Cl. 224-39.000.
Coal Industry (Patents) Limited: *See*—
Garner, David, 4,096,940, Cl. 198-560.000.
Mullins, Rex, 4,096,753, Cl. 73-432.00R.
Cochran, Thomas E., to Caterpillar Tractor Co. Control linkage arrangement. 4,096,765, Cl. 74-473.00R.
Coffinberry, George A., to General Electric Company. Method of manufacturing a concentric tube heat exchanger. 4,096,616, Cl. 29-157.30A.
Coffinberry, George A.; and Kast, Howard B., to General Electric Company. Concentric-tube stacked plate heat exchanger. 4,096,910, Cl. 165-81.000.
Cohen, Arnold, to Jones & Vining, Incorporated. Testing footwear soles. 4,096,733, Cl. 73-7.000.
Cohen, Howard Joseph; and Vojik, Francis Michael, to SCM Corporation. Flatting agents. 4,097,302, Cl. 106-312.000.
Cohen, Leonard D., to Cutler-Hammer, Inc. Thermoelectric compensation for voltage control devices. 4,097,829, Cl. 334-15.000.
Coherent, Inc.: *See*—
Manoukian, Nubar Sahag; and Johnston, Thomas Frazier, Jr., 4,097,818, Cl. 331-94.50C.
Cohn, Marvin, to Westinghouse Electric Corp. Push-pull power amplifier. 4,097,814, Cl. 330-286.000.
Coil Sales & Manufacturing Co.: *See*—
Summers, Frank C., 4,097,683, Cl. 174-38.000.
Coker, George T., Jr., to Shell Oil Company. Adhesive composition. 4,097,434, Cl. 260-23.300.
Cole, Clarence R.; and Duncan, Robert L., to Goodyear Tire & Rubber Company, The. Tire press and mold leakage control. 4,097,565, Cl. 264-40.300.
Cole, Herbert S., Jr., to General Electric Company. Multi-colored liquid crystal displays. 4,097,130, Cl. 350-335.000.
Coleman, John H.; and Marks, Tobin J., to Northwestern University; and Plasma Physics Corporation. Process for uranium isotope separation. 4,097,384, Cl. 250-527.000.
Coleman, Kenneth: *See*—
Wilson, Michael A.; Momparler, Fred J.; and Coleman, Kenneth, 4,097,769, Cl. 307-252.00B.
Colgate Palmolive Company: *See*—
Bauman, Robert Andrew, 4,097,600, Cl. 424-267.000.
Colling, Ronald L.: *See*—
Kindermann, Joseph C.; and Colling, Ronald L., 4,096,841, Cl. 123-148.00E.
Collins, Walter W., to Brewer, Robert W., Jr. Belt buckle knife. 4,096,979, Cl. 224-26.00B.
Colombo, Giuseppe; and Grossi, Mario D., to Smithsonian Institution. Satellite connected by means of a long tether to a powered spacecraft. 4,097,010, Cl. 244-158.000.
Colombo, Paolo: *See*—
Radici, Pierino; Custro, Sergio; and Colombo, Paolo, 4,097,453, Cl. 260-45.90P.
Columbus McKinnon Corporation: *See*—
Schreyer, Kenneth D., 4,097,024, Cl. 254-169.000.
Combustion Engineering, Inc.: *See*—
Gibbons, John Francis; and McLaughlin, Daniel John, 4,097,332, Cl. 176-87.000.
Cominco Ltd.: *See*—
Swinkels, Godefridus M.; Milner, Edward F. G.; and Genik-Sas-Berezowsky, Roman Michael, 4,097,271, Cl. 75-104.000.
Comitato Nazionale per l'Energia Nucleare: *See*—
Scuricini, Giovan Battista, 4,096,988, Cl. 233-23.00A.
Commissariat a l'Energie Atomique: *See*—
Feve, Lucette; and Fontaine, Remy, 4,097,738, Cl. 250-305.000.
Commonwealth Scientific and Industrial Research Organization: *See*—
Evans, John James Alexander; and Holan, George, 4,097,599, Cl. 424-263.000.
Compagnie Francaise de Raffinage: *See*—
Muller, Alain, 4,097,412, Cl. 252-465.000.
Compagnie Generale d'Electricite S.A.: *See*—
Jacquelin, Jean, 4,097,357, Cl. 204-252.000.
Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris": *See*—
Lamy, Jacques Edouard, 4,096,705, Cl. 61-111.000.
Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See*—
Pichon, Michel, 4,096,748, Cl. 73-362.0AR.
Conforti, Frederick J., to Pittway Corporation. Means for adjusting and for testing a detecting device. 4,097,850, Cl. 340-214.000.
Connors, Charles W., to Nalco Chemical Company. Ingot mold base member. 4,097,019, Cl. 249-204.000.
Container Corporation of America: *See*—
Gardner, Jeffrey M., 4,096,984, Cl. 229-15.000.
Continental Oil Company: *See*—
Yang, Kang; Motz, Kaye L.; and Reedy, James D., 4,097,535, Cl. 260-603.00C.
Conway, Kenneth Edward; Freeman, Thomas Edward; and Charudat-

tan, Raghavan, to Abbott Laboratories. Method and compositions for controlling waterhyacinth. 4,097,261, Cl. 71-66.000.

Conwed Corporation: *See—*
Videen, Otis R., 4,097,638, Cl. 428-213.000.

Cook, Charles R., Jr., to International Telephone & Telegraph Corporation. Semiconductor scribing method. 4,096,619, Cl. 29-413.000.

Cook, Herbert G.; and McAvity, Jack A., to E.S. & A. Robinson (Canada) Ltd. Laminate for use in packing oil. 4,096,946, Cl. 206-484.200.

Cook, Peter William; Parrish, James Thomas; and Schuster, Stanley Everett, to International Business Machines Corporation. Comparator circuit for a C-2C A/D and D/A converter. 4,097,753, Cl. 307-359.000.

Cooke, William Ernest; Hodgson, John; and Sasaki, Mitsuo, to Alcan Research and Development Limited. Electroplating aluminum stock. 4,097,342, Cl. 204-28.000.

Cooksley, Ralph D. Steam generating apparatus and gas burner. 4,097,224, Cl. 431-352.000.

Cooper, Glenn D.: *See—*
Bennett, James G.; and Cooper, Glenn D., 4,097,458, Cl. 260-47.0ET.
Bennett, James G.; and Cooper, Glenn D., 4,097,459, Cl. 260-47.0ET.

Cooper, Gordon J.: *See—*
Anderson, William C.; Cooper, Gordon J.; and Tyke, Charlie R., 4,097,918, Cl. 362-147.000.

Cooper Laboratories, Incorporated: *See—*
Salem, Harry; and Aviado, Domingo M., 4,097,577, Cl. 424-273.00R.

Coors Container Company: *See—*
Dulmaine, Joseph Francis; and Bagrosky, Michael Edward, 4,096,814, Cl. 113-120.00M.

Coplin, Clarence William: *See—*
Hause, Leroy Robert; and Coplin, Clarence William, 4,096,755, Cl. 73-598.000.

Copyer Co., Ltd.: *See—*
Kitahara, Makoto; Ishikawa, Shozo; Katagiri, Kazuharu; Arita, Tetsuo; and Masubuchi, Shoji, 4,097,646, Cl. 428-323.000.

Cormier, Paul S. Lock-latch set. 4,096,716, Cl. 70-139.000.

Corning Glass Works: *See—*
Brezinski, Donald P., 4,097,735, Cl. 250-252.000.
Chyung, Kenneth; and Wusirika, Raja R., 4,097,295, Cl. 106-52.000.
Locke, Gerald M., 4,097,915, Cl. 361-433.000.
Thomas, Walter B., III; and Welker, Christopher H., 4,097,296, Cl. 106-53.000.

Cosco, Robert J.; Lo, John M.; and Hebert, Roger T., to GTE Sylvania Incorporated. Arc discharge flash lamp and shielded cold cathode therefor. 4,097,774, Cl. 313-178.000.

Cote, Paul T.; and Schupp, Lewis J., to General Electric Company. Flash lamp array having shorting lamps. 4,097,220, Cl. 431-95.00A.

Cotter, James A. Self-cleaning cat waste disposal device. 4,096,827, Cl. 119-1.000.

Coupek, Jiri: *See—*
Mikes, Otakar; Strop, Petr; and Coupek, Jiri, 4,097,420, Cl. 260-2.10R.

Coviello, Vincenzo: *See—*
Siegrist, Adolf Emil; and Coviello, Vincenzo, 4,097,515, Cl. 260-465.00G.

Cox, Bernard K. Method for producing a foldable plastic strip. 4,097,571, Cl. 264-296.000.

Coyle, Bernard H., Jr.: *See—*
Rao, Mannige Vikram; Coyle, Bernard H., Jr.; and Gallagher, Peter C. J., 4,097,270, Cl. 75-68.00R.

Coyne, William E.: *See—*
Banitt, Elden H.; and Coyne, William E., 4,097,481, Cl. 260-293.770.

Cozzoli Machine Company: *See—*
McMickle, John F., Jr., 4,096,683, Cl. 53-244.000.

Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., to Merck & Co., Inc. 11,12-Secoprostaglandins. 4,097,504, Cl. 260-405.000.

Cramer, Alfons. Underwater housing for photographic cameras. 4,097,878, Cl. 354-64.000.

Cramer, Rudolf; and Hildebrandt, Juergen J., to Messerschmitt-Boelkow-Blohm GmbH. Telescopically adjustable surgical instrument. 4,096,857, Cl. 128-84.00R.

Crawford, Daniel G.; James, Stanley E.; and Nixon, Donald H., to General Motors Corporation. Flexible exhaust coupling. 4,097,071, Cl. 285-94.000.

Creemers, Henricus M. J. C.; Graff, Renier J. L.; and Verschoor, Hendrinus M., to Stamicarbon, N.V. Process of polymerizing α-olefins in the liquid phase. 4,097,659, Cl. 526-151.000.

Cremer, Hans H.: *See—*
Garber, Arnold L.; and Cremer, Hans H., 4,097,156, Cl. 356-152.000.

Creston Valley Foods Ltd.: *See—*
Powrie, William Duncan; and Tung, Marvin, 4,097,612, Cl. 426-269.000.

Crickman, Charles W.: *See—*
Miner, Mark S.; and Crickman, Charles W., 4,096,805, Cl. 102-214.000.

Cross, Kenneth R., to General Motors Corporation. Turbine rotor fabrication. 4,096,615, Cl. 29-156.80R.

Cross, William E., to General Motors Corporation. Accessory electrical connector. 4,097,109, Cl. 339-147.00R.

Crossman, Richard E.: *See—*
Uhtenwoldt, Herbert R.; Humes, Norman S.; and Crossman, Richard E., 4,096,667, Cl. 51-99.000.

Cruea, Ronald DeWayne, to Black Clawson Company, The. Dewatering screen. 4,097,382, Cl. 210-456.000.

Cubbon, Robert Charles Patrick; Russell, Peter John; Talbot, Robert Eric; and Woodbridge, David Thomas, to Interox Chemicals Limited. Preparation of a bleach. 4,097,536, Cl. 260-610.00R.

Culbertson, Harry M., to Monsanto Company. Process for preparing high ortho novolac resins. 4,097,463, Cl. 260-57.00A.

Cunningham, Robert E., to Goodyear Tire & Rubber Company, The. Method of preparing block polymers. 4,097,557, Cl. 260-880.00B.

Cupper, Robert Alton; and Shiffler, Richard Welty, to Union Carbide Corporation. Silicone-hydrocarbon compositions. 4,097,393, Cl. 252-78.300.

Curnuck, Roy F. Television light shield. 4,097,902, Cl. 358-255.000.

Curran, Laurence E. Ventilation and insulation baffle. 4,096,790, Cl. 98-37.000.

Curran, Matthew J.: *See—*
Arendt, Ronald H.; and Curran, Matthew J., 4,097,343, Cl. 204-37.00R.

Curry, Harold George; Attwood, Brian William; White, Derek Graham Walter; Christensen, John Mosgaard; and Kroyer, Karl Kristian Kobs, to Karl Kroyer St. Anne's Limited. Production of fibrous sheet material. 4,097,640, Cl. 428-219.000.

Curtiss-Wright Corporation: *See—*
Kulina, Mark R., 4,097,192, Cl. 416-175.000.

Custro, Sergio: *See—*
Radici, Pierino; Custro, Sergio; and Colombo, Paolo, 4,097,453, Cl. 260-45.90P.

Cutler-Hammer, Inc.: *See—*
Cohen, Leonard D., 4,097,829, Cl. 334-15.000.
Garnier, John J., 4,097,223, Cl. 431-191.000.
Piber, Earl T., 4,097,704, Cl. 200-157.000.
Zalar, David R.; and Hansen, James E., 4,097,842, Cl. 340-71.000.

Cymbal, William D., to General Motors Corporation. Transmission shift control. 4,096,717, Cl. 70-248.000.

Cyr, Reginald J. Underwater transponder calibration arrangement. 4,097,837, Cl. 340-5.00C.

Dadson, Joseph E.: *See—*
Agarwal, Mahesh C.; and Dadson, Joseph E., 4,096,859, Cl. 128-213.000.

Dafter, Robert Vincent, Jr., to Western Electric Company, Inc. Method of depositing a metal on a surface. 4,097,286, Cl. 106-1.110.

Dagma GmbH & Co. Deutsche Automaten- und Getranke - Maschinen: *See—*
Kuckens, Alexander, 4,096,971, Cl. 222-1.000.

Dahmen, Martin: *See—*
Bachtold, Jakob H.; and Dahmen, Martin, 4,097,709, Cl. 219-10.55R.

Daiichi Seiyaku Co., Ltd.: *See—*
Miki, Tosaku; Hosokawa, Yasuhiro; Miwa, Tamotsu; Fujita, Hiroshi; Asano, Masahide; and Aibara, Shunzo, 4,097,608, Cl. 424-324.000.

Daimler-Benz Aktiengesellschaft: *See—*
Wulf, Helmut; and Weidemann, Wolfgang, 4,097,752, Cl. 290-20.000.

Dake, Nolan, to Dake, Nolan. Lifting mechanism. 4,096,955, Cl. 214-75.00G.

Dakss, Mark L.: *See—*
Wellington, Charles K.; and Dakss, Mark L., 4,097,129, Cl. 350-96.150.

Dalton, James M.: *See—*
Casull, Don C.; Dalton, James M.; Jackson, Calvin W.; and Jackson, Amos R., 4,096,832, Cl. 123-32.0SP.

Daly, William P.; Lewis, Robert P.; and Pouliot, Oliver L., to Faser Industries. Method of detecting heat seal breaks and package thereof. 4,097,236, Cl. 23-230.00L.

D'Amico, John J., to Monsanto Company. 2-Substituted-1,3(2H,4H)-isoquinolinediones as plant growth regulants. 4,097,260, Cl. 71-94.000.

Damon, Neil F.: *See—*
Holt, Richard C.; Damon, Neil F.; and Hanlon, Richard J., 4,097,101, Cl. 339-17.00C.

Danbar, Inc.: *See—*
Petrucci, Primo O., 4,097,016, Cl. 248-418.000.

Danfoss A/S: *See—*
Karll, Bent, 4,096,708, Cl. 62-275.000.
Nygaard, Nils Hansson; Nielsen, Kaj; and Strandtoft, Benny, 4,097,788, Cl. 318-415.000.
Olsen, Gunnar Ernst Rudolf; Iversen, Poul Christian Carlos; and Birker, Bertel, 4,097,719, Cl. 219-364.000.

Dany, Franz-Josef; Mietens, Gerhard; and Schallus, Erich, to Hoechst Aktiengesellschaft. Process for imparting antistatic properties to plastics. 4,097,656, Cl. 526-1.000.

Dany, Franz-Josef: *See—*
Wortmann, Joachim; Dany, Franz-Josef; and Kandler, Joachim, 4,097,400, Cl. 252-182.000.

Darling, Thomas Robert, to Du Pont de Nemours, E. I., and Company. Polyurethane coating composition curable by addition polymerization. 4,097,439, Cl. 260-31.20N.

Daruschy, Paul: *See—*
Guber, Walter; Saidl, Jaroslav; Daruschy, Paul; and Hild, Werner, 4,097,401, Cl. 252-301.10W.

Daspit, Ronald Albert. Clamp for repair of leaking underwater pipelines. 4,096,886, Cl. 138-99.000.

Data General Corporation: *See—*
Seligman, Lawrence; Ballard, James P.; and Jeffery, Edwin A., 4,097,729, Cl. 235-467.000.

Datta, Pabitra, to Addressograph-Multigraph Corporation. Phosphonitrile fluoroelastomer coated carrier particles for use in electrophotographic process. 4,097,617, Cl. 427-14.000.

Daussan et Compagnie: *See—*
Daussan, Henri Jean, 4,096,976, Cl. 222-591.000.

Daussan, Henri Jean, to Daussan et Compagnie. Vessels for transferring liquid metal having a removable insulating lining. 4,096,976, Cl. 222-591.000.

Davey, Richard G., to Owens-Illinois, Inc. Glass molding process with mold lubrication. 4,097,257, Cl. 65-26.000.

David Brown-Vosper (Offshore) Limited: *See—*
Adamson, Stewart Marr; and Bliault, Alan Edgar John, 4,096,704, Cl. 61-95.000.

Davidson, Bruce Lloyd: *See—*
Peake, Clinton Joseph; Harnish, Wayne Nelson; and Davidson, Bruce Lloyd, 4,097,594, Cl. 424-246.000.

Davis, Gerald Titus; and Shackle, Dale Richard, to Mead Corporation, The. Manifold carbonless form and process for the continuous production thereof. 4,097,619, Cl. 427-44.000.

Davis, Herbert C. Sheet entry and automatic copying apparatus. 4,097,066, Cl. 282-29.00B.

Davis, Robert A.: *See—*
Brewer, Arthur D.; and Davis, Robert A., 4,097,580, Cl. 424-277.000.

Davitz, Walter E., to White Castle System, Inc. Workpiece-supporting rack. 4,097,359, Cl. 204-297.00W.

Dawson, John W.: *See—*
Morrison, Ronald L.; and Dawson, John W., 4,097,610, Cl. 426-1.000.

Dawson, Lorna Ann. Stereophonic electromagnetic pickup device for stringed musical instruments. 4,096,780, Cl. 84-1.160.

Dayco Corporation: *See—*
Richmond, Kenneth D.; Hartman, Russell E.; Rogers, Jerry W.; and Nelson, Jack, 4,096,764, Cl. 74-233.000.

DBX, Incorporated: *See—*
Blackmer, David E.; and Jaeger, C. Rene, 4,097,767, Cl. 307-229.000.

Dean, Albert G., to Budd Company, The. Pneumatic coil spring support for vehicles. 4,097,063, Cl. 280-712.000.

Dear, Robert Ernest Arthur; and Falk, Robert Allan, to Ciba-Geigy Corporation. Fabric coated with RF-glycols containing two perfluoroalkylthio groups. 4,097,642, Cl. 428-262.000.

Deegan, Dennis C.: *See—*
Schell, Charles E.; Deegan, Dennis C.; and Jacques, Donald F., 4,097,341, Cl. 204-1.00T.

Deets, Gary L.; and Shapras, Peter, to Monsanto Company. Nitrogenous polymer compositions. 4,097,552, Cl. 260-876.00R.

Defago, Raymond: *See—*
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, 4,097,229, Cl. 8-1.00A.

Dehait, Jack T., to Systems Research Laboratories, Inc. Half-maximum threshold circuit for optical micrometer. 4,097,158, Cl. 356-160.000.

Dehlsen, James G. P.: *See—*
Haber, Terry M.; and Dehlsen, James G. P., 4,096,974, Cl. 222-402.130.

Deike, Robert F., to Foresight Industries. Method of anchoring. 4,096,673, Cl. 52-156.000.

Del Laboratories, Inc.: *See—*
Shansky, Albert, 4,097,589, Cl. 424-61.000.

DeLauder, William R.; and Spring, Ferdinand E., to Ralston Purina Company. Process for preparing a protein fortified natural cereal. 4,097,613, Cl. 426-303.000.

De Leo, Richard V.; and Hagen, Floyd W., to Rosemount Inc. Pressure sensor for determining airspeed, altitude and angle of attack. 4,096,744, Cl. 73-180.000.

Dellorfano, Fred M., Jr.: *See—*
Massa, Frank, 4,096,933, Cl. 194-100.00A.

Delmag-Maschinenfabrik Reinhold Dornfeld: *See—*
Hennecke, Rudolf; and Haussmann, Albert, 4,096,916, Cl. 173-137.000.

DelPercio, Michael J.; and Krejci, Wayne E., to Intertherm, Inc. Multiple unit electrical baseboard heater. 4,097,721, Cl. 219-366.000.

del Ser Gonzalez, Clemente. Olive pitter and stuffer. 4,096,794, Cl. 99-494.000.

Del Ser Gonzalez, Clemente. Olive pitting and stuffing machine. 4,096,795, Cl. 99-494.000.

De Luca, Paul V.; and Atun, Albert, to Porta Systems Corp. Telephone connector block having electrical clip interconnecting means. 4,097,102, Cl. 339-19.000.

DeLuca, Salvatore A. Locating of tubes in the human body. 4,096,862, Cl. 128-348.000.

Demag Aktiengesellschaft: *See—*
Beggs, James Ingram; Langlitz, Karlheinz; Schmitz, Gunter; and Jansa, Wolfgang, 4,096,918, Cl. 177-145.000.

DEMAG Kunststofftechnik Zweigniederlassung der DEMAG AG: *See—*
Fries, Bernd, 4,097,928, Cl. 366-336.000.

Demmin, Timothy R.: *See—*
Rogic, Milorad M.; Demmin, Timothy R.; and Klein, Karl P., 4,097,517, Cl. 260-465.400.

Den Boer, Cornelis, to Imperial Chemical Industries Limited. Mattresses for subaqueous structures. 4,096,701, Cl. 61-38.000.

Denka Chemical Corporation: *See—*
Barone, Bruno J.; and Kerr, Ralph O., 4,097,498, Cl. 260-346.750.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Komatsu, Koei; Itoyama, Kenji; Hirota, Jun; and Nishijima, Akio, 4,097,661, Cl. 526-175.000.

Depin, Jean-Claude: *See—*
Briet, Philippe; Berthelon, Jean-Jacques; Depin, Jean-Claude; and Boschetti, Eugene, 4,097,582, Cl. 424-283.000.

Derbyshire, George Cecil, to Jacobs Manufacturing Company, Limited, The. Drill chucks. 4,097,054, Cl. 279-64.000.

DeRemigis, Joseph, to Sentrol Systems Ltd. Method and apparatus for measuring the electrophoretic mobility of suspended particles. 4,097,153, Cl. 356-103.000.

De Roeck, Joseph Irma; and Christiaen, Lucien Antoine, to Agfa-Gevaert N.V. Butt-splicer. 4,097,323, Cl. 156-159.000.

Derr, Bernard A. Spray nozzle. 4,097,000, Cl. 239-599.000.

Dervinis, Alphonse: *See—*
Begany, Albert J.; Rosenthale, Marvin E.; and Dervinis, Alphonse, 4,097,596, Cl. 424-247.000.

Desaar, Rene. Lance for desulphurizing cast iron or steel. 4,097,030, Cl. 266-225.000.

Deschenes, Pierre J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Barrier for wheeled vehicles. 4,096,782, Cl. 89-1.00A.

DeSisto, Richard E.: *See—*
Soler, Norman V.; and DeSisto, Richard E., 4,097,722, Cl. 219-368.000.

Desor, Gerhard, to Hauser Verwaltungs-Gesellschaft mit beschrankter Haftung. Pressure gauge for indicating small pressure changes. 4,096,759, Cl. 73-731.000.

DeTorre, Robert P., to PPG Industries, Inc. Self-aligning apparatus for scoring fracturable material. 4,096,773, Cl. 83-8.000.

Dettmann, Charles R.; and Frederick, John J., to Electronic Surveillance Fence Security, Inc. Electronic fence surveillance apparatus. 4,097,025, Cl. 256-1.000.

DeVos, Marc Francois; and Gouw, Hoan Giok. Slide-puzzle. 4,097,049, Cl. 273-153.00S.

Dewhurst, Harold A.: *See—*
Foley, Kevin M.; Dewhurst, Harold A.; and McCombs, Frank P., 4,097,568, Cl. 264-216.000.

Dezawa, Shin-ichiro: *See—*
Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Dezawa, Shin-ichiro, 4,097,650, Cl. 428-336.000.

Dhake, Bhimashanker Gopal, to M & T Chemicals Inc. Thixotropic aqueous coating composition of solubilized polymer with dispersion of quaternary ammonium clay in aliphatic hydrocarbon. 4,097,437, Cl. 260-29.20E.

Diamond, Joseph M., to McNab, Incorporated. Shaft torque measuring system. 4,096,743, Cl. 73-136.00A.

Diamond Shamrock Corporation: *See—*
Sieglaff, Charles L.; Hora, Charles J.; and Tiefenbach, Joseph P., 4,097,657, Cl. 526-30.000.
Wiseman, Russell M., 4,097,358, Cl. 204-270.000.

Di Bella, Eugene P.: *See—*
Keyworth, Donald A.; Di Bella, Eugene P.; and Rosen, Marvin, 4,097,451, Cl. 260-45.70R.

Diceglie, Giacomo. Lighted message board construction. 4,096,656, Cl. 40-564.000.

Dickinson, Harry D. Modular traffic controller. 4,097,170, Cl. 404-6.000.

Dickson, Andrew C.; and Kontz, Robert F., to Owens-Illinois, Inc. Method for making plastic articles. 4,097,570, Cl. 264-296.000.

Diels, Manfred; Dienstuhl, Karl Wilhelm; Jager, Tilo; and Hocker, Eitel, to Otto Fuchs KG.; and Schuco Heinz Schurmann GmbH & Co. Insulated construction element. 4,096,678, Cl. 52-403.000.

Dienstuhl, Karl Wilhelm: *See—*
Diels, Manfred; Dienstuhl, Karl Wilhelm; Jager, Tilo; and Hocker, Eitel, 4,096,678, Cl. 52-403.000.

Dieterich, Dieter, to Bayer Aktiengesellschaft. Inorganic-organic compositions. 4,097,423, Cl. 260-2.5AK.

Dietlein, Robert W. Ski insert for anchoring a ski binding screw in a ski. 4,097,061, Cl. 280-607.000.

Dietz, Kurt: *See—*
Pfeiler, Manfred; and Dietz, Kurt, 4,097,741, Cl. 250-322.000.

Diggs, Richard E. Adjustable jib crane. 4,096,952, Cl. 212-56.000.

DiGiulio, Adolph V.; and Bauer, Jack N., to Arco Polymers, Inc. Rubber modified dicarboxylic acid copolymer blends. 4,097,551, Cl. 260-876.00B.

Dir, Gary A.: *See—*
Haas, Werner E. L.; and Dir, Gary A., 4,097,127, Cl. 350-332.000.

Dirscherl, George W.: *See—*
Iverson, Lowell P.; Dirscherl, George W.; and Hagen, Paul D., 4,096,957, Cl. 214-145.00R.

Dittmar, Wilfried, to WERSI-electronic GmbH & Co. Kommanditgesellschaft fur elektronische Bauelemente. Apparatus for processing tone signals. 4,096,778, Cl. 84-1.250.

Doctor Andreu, S.A.: *See—*
Porta, Angel Lazaro; and Paniello, Antonio Ibanez, 4,097,528, Cl. 260-570.00R.

Dr. C. Otto & Comp. G.m.b.H.: *See—*
Pries, Erich, 4,097,340, Cl. 202-241.000.

Doemen, Benno, to Papst-Motoren KG. Rotation-supervised d-c fan or blower system. 4,097,789, Cl. 318-461.000.

Dole, James R.; and Blaine, Benjamin F., to Arrow Machine, Inc. Double acting rack and gear-driven piston pump. 4,097,199, Cl. 417-286.000.

Dolhyj, Serge R.; Milberger, Ernest C.; and Evans, Sandra R., to Standard Oil Company. Use of coated catalysts in the preparation of maleic anhydride. 4,097,501, Cl. 260-346.740.

Domas, Paul A.: *See—*
Barack, William N.; Gay, Charles H., Jr.; Beekman, Stephen W.; and Domas, Paul A., 4,097,194, Cl. 416-244.00A.

Dominion Engineering Works Limited: *See—*
Futcher, Ralph James, 4,096,643, Cl. 34-122.000.

Dondoshansky, Alexandr Lvovich: *See—*
Rivkin, Ilya Yakovlevich; Aisin, Shamil Mustafovich; Garkusha, Olga Ivanovna; Dondoshansky, Alexandr Lvovich; Zellis, Evgeny Alfredovich; Karpov, Vladilen Efremovich; Sorokin, Vladimir Konstantinovich; and Shishkin, Oleg Petrovich, 4,096,745, Cl. 73-194.00B.

Donermeyer, Donald D.: *See—*
Martins, Joseph G.; and Donermeyer, Donald D., 4,097,445, Cl. 260-40.00R.

Donofrio, John D., to Joanna Western Mills Company. Roller shade braking mechanism. 4,096,904, Cl. 160-299.000.

Dorr-Oliver Incorporated: *See—*
Jukkola, Walfred Wilhelm, 4,096,909, Cl. 165-76.000.

Dorrian, John F., to Erie Technological Products, Inc. Base metal electrode capacitor and method of making the same. 4,097,911, Cl. 361-305.000.

Dorsey, Geoffrey A., Jr., to Kaiser Aluminum & Chemical Corporation. Pretreatment for the resistance welding of aluminum. 4,097,312, Cl. 148-6.270.

Dorsey-McComb Distributors, Inc.: *See—*
McComb, Kenneth H.; and McComb, Timothy I., 4,097,213, Cl. 425-376.00B.

Doyle, Jr.; William C.: *See—*
Kirkpatrick, Joel L.; and Doyle, Jr.; William C., 4,097,264, Cl. 71-90.000.

Draper Shade and Screen Co.: *See—*
Broome, Michael D., 4,097,013, Cl. 248-171.000.

Drasch, Josef: *See—*
Schild, Josef; Scheiber, Robert; Schmidt, Harald; Drasch, Josef; and Keznickl, Eduard, 4,097,906, Cl. 360-13.000.

Dresser Industries, Inc.: *See—*
Phillips, Victor Quin; Griffin, Phil Harmon; and Sharki, Martin James, 4,097,249, Cl. 55-41.000.
Phillips, Victor Quin; Griffin, Phil Harmon; and Sharki, Martin James, 4,097,253, Cl. 55-169.000.
Van Houtte, Richard George, 4,097,073, Cl. 285-197.000.

Drobnik, Jaroslav; Kopecek, Jindrich; Labsky, Jiri; Rejmanova, Pavla; Exner, Josef; and Kalal, Jaroslav, to Ceskoslovenska akademie ved. Preparation of biogically active substances bearing $-NH_2$ groups in a form releasable by enzymatic cleavage. 4,097,470, Cl. 260-78.00A.

Drury, Robert Finley, to Du Pont de Nemours, E. I., and Company. Electrochemical coupling of perfluoroalkyl iodides. 4,097,344, Cl. 204-59.00R.

Dubuque, Douglas K., to Tyee Aircraft, Inc. Method of swage joining a rod end to a tube and the product thereof. 4,097,163, Cl. 403-274.000.

Duke, James T.: *See—*
Shelby, Robert L.; Duke, James T.; and Parker, Duane L., 4,097,093, Cl. 305-22.000.

Dulmaine, Joseph Francis; and Bagrosky, Michael Edward, to Coors Container Company. Container with outwardly flexible bottom end wall having integral support means and method of manufacture therefore. 4,096,814, Cl. 113-120.00M.

Duncan, Robert L.: *See—*
Cole, Clarence R.; and Duncan, Robert L., 4,097,565, Cl. 264-40.300.

Dunshee, Robert S., to United States Steel Corporation. Plasma arc cutting water tables. 4,097,713, Cl. 219-121.00P.

Dupler, William W., to General Motors Corporation. Sheet metal draw die apparatus. 4,096,729, Cl. 72-350.000.

Du Pont de Nemours, E. I., and Company: *See—*
Agers, Brian Michael; and Todd, Maurice Cornelius, 4,096,612, Cl. 28-272.000.
Beveridge, Wendell Hazelton, Jr.; and Van Over, William Edward, 4,096,754, Cl. 73-432.00R.
Cheng, Jiin-Duey, 4,097,262, Cl. 71-90.000.
Darling, Thomas Robert, 4,097,439, Cl. 260-31.20N.
Drury, Robert Finley, 4,097,344, Cl. 204-59.00R.
Fuchs, Julius Jakob, 4,097,673, Cl. 560-16.000.
Guy, Richard Ernest, 4,096,894, Cl. 141-93.000.
Howard, Edward George, Jr., 4,097,447, Cl. 260-42.140.
James, Daniel Shaw, 4,097,475, Cl. 260-157.000.
Kane, William Paul, 4,097,433, Cl. 260-23.0AR.
Keene, Frederick J., 4,097,297, Cl. 106-177.000.
Novak, Ernest Richard, 4,097,553, Cl. 260-876.00R.
Patterson, Frank Knowles; and Rellick, Joseph Richard, 4,097,653, Cl. 428-433.000.
Sayre, James Franklin, 4,096,609, Cl. 28-155.000.
Shannon, Robert Day,, 4,097,345, Cl. 204-59.0AM.
Wildt, Hans-Achim Dietmar, 4,097,301, Cl. 106-300.000.

Duse, Gregory E. Drain opening device. 4,096,597, Cl. 4-255.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Buning, Robert; and Bier, Gerhard, 4,097,436, Cl. 260-29.60H.

E. R. Squibb & Sons, Inc.: *See—*
Breuer, Hermann; and Treuner, Uwe D., 4,097,670, Cl. 544-27.000.

E.S. & A. Robinson (Canada) Ltd.: *See—*
Cook, Herbert G.; and McAvity, Jack A., 4,096,946, Cl. 206-484.200.

E-Systems, Inc.: *See—*
Beilein, Loraine F.; and Burkett, Frank S., Jr., 4,096,983, Cl. 228-122.000.
Lund, Bryant D., 4,097,786, Cl. 318-282.000.

Eastman Kodak Company: *See—*
Bissonette, Vernon L., 4,097,278, Cl. 96-22.000.
Gardner, Sylvia Alice; and Lelental, Mark, 4,097,281, Cl. 96-48.0HD.
Noonan, John Michael; McConkey, Robert Charles; and Hanrahan, Michael John, 4,097,282, Cl. 96-73.000.
Sandhu, M. Akram, 4,097,230, Cl. 8-2.50A.

Eaton Corporation: *See—*
Clayton, Russell K., 4,097,075, Cl. 285-332.300.
Gee, Thomas A., 4,097,756, Cl. 310-155.000.
Larson, Douglas A., 4,097,699, Cl. 200-61.45R.
Yip, James K., 4,096,883, Cl. 137-596.130.

Ebel, Eckhard; Kobel, Hans-Rudolf; and Widmer, Ernst, to Adolf Schmids Erben Aktiengesellschaft. Process for reclaiming used hydrocarbon oils. 4,097,369, Cl. 208-180.000.

Eberhardt, Edward Herbert, to International Telephone & Telegraph Corporation. Thermal camera tube. 4,097,742, Cl. 250-333.000.

Eckert, Alton B., Jr.; Jones, Howell A., Jr.; and Check, Frank T., Jr., to Pitney-Bowes, Inc. Remote postage meter charging system using an advanced microcomputerized postage meter. 4,097,923, Cl. 364-900.000.

Eckert, Konrad; Hofmann, Karl; and Seifert, Kurt, to Robert Bosch GmbH. Fuel injection valve for preliminary and principal injection. 4,096,999, Cl. 239-533.500.

Eckhardt, Friedhelm, to U.S. Philips Corporation. Hinge mechanism. 4,096,604, Cl. 16-128.100.

Economy, Constantine F.: *See—*
Harvey, John K., Jr.; Watson, Morris T.; Economy, Constantine F.; and LeFevre, Robert J., 4,096,893, Cl. 141-90.000.

Eder, Ulrich: *See—*
Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,097,334, Cl. 195-51.00G.

Edinger, Winfried Franz: *See—*
Wachter, Rudolf Ludwig; and Edinger, Winfried Franz, 4,096,793, Cl. 99-467.000.

Edwin Cooper and Company Limited: *See—*
Askew, Herbert Frank; Jayne, Gerald John Joseph; and Elliott, John Scotchford, 4,097,474, Cl. 260-139.000.

Egan, Clark J., to Chevron Research Company. Hydrocracking in the presence of water and a low hydrogen partial pressure. 4,097,364, Cl. 208-111.000.

Egan, Walter G.; Hallock, Herbert B.; and Hilgeman, Theodore W., to Grumman Aerospace Corporation. Retroreflectance measuring apparatus. 4,097,751, Cl. 250-571.000.

Egyt Gyogyszervegyeszeti Gyar: *See—*
Benko, Pal; Simonek, Ildiko; Pallos, Laszlo; Kovacs, Jeno; and Magyar, Karoly, 4,097,668, Cl. 542-418.000.

Ehgartner, Gabriele: *See—*
Stemme, Otto; Lermann, Peter; and Ehgartner, Gabriele, 4,097,133, Cl. 352-243.000.

Ehrlich, Stephen Jeffrey; and Beyer, Edward Robert, to Motorola, Inc. Remote telephone coupler as for medical emergency data transmission. 4,097,691, Cl. 179-2.00C.

Eide, Richard H.; and Golembeck, Gerald A., to United States Bedding Company, The. Mattresses and method for producing mattresses. 4,096,595, Cl. 5-345.00R.

Eldec Corporation: *See—*
Thorson, Eric K., 4,097,799, Cl. 324-99.00R.

Electric Power Research Institute, Inc.: *See—*
Perry, Elijah R.; Angwin, Meredith J.; Rabinowitz, Mario; and Shimshock, John F., 4,097,682, Cl. 174-15.00R.

Electro Corporation: *See—*
Wilson, Michael A.; Momparler, Fred J.; and Coleman, Kenneth, 4,097,769, Cl. 307-252.00B.

Electronic Surveillance Fence Security, Inc.: *See—*
Dettmann, Charles R.; and Frederick, John J., 4,097,025, Cl. 256-1.000.

Electronized Chemicals Corporation: *See—*
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Elektromaschinen AG: *See—*
Bachtold, Jakob H.; and Dahmen, Martin, 4,097,709, Cl. 219-10.55R.

Elf Union: *See—*
Lamy, Henri, 4,096,908, Cl. 165-64.000.

Elgeti, Klaus: *See—*
Krambrock, Wolfgang; Schwedes, Hansjorg; Richter, Wolfgang; and Elgeti, Klaus, 4,096,640, Cl. 34-10.000.

Elghani, Salah Elabd; Fischer, Winfried; and Prinz, Richard, to Bayer Aktiengesellschaft. Thermoplastically processible moulding compound of cellulose esters and ethylene/vinyl esters copolymers. 4,097,429, Cl. 260-17.00R.

Ellbrunner, Adalbert: *See—*
Stock, Horst; and Ellbrunner, Adalbert, 4,097,329, Cl. 156-617.0SP.

Ellingson, Chester W., Jr. Window sealing structure. 4,096,665, Cl. 49-475.000.

Elliott, John Scotchford: *See—*
Askew, Herbert Frank; Jayne, Gerald John Joseph; and Elliott, John Scotchford, 4,097,474, Cl. 260-139.000.

Emerson Electric Co.: *See—*
Behr, Joseph L., 4,096,993, Cl. 236-68.00B.
Bobrick, Mitchell; Quin, Murray L.; and Buzan, Morris M., 4,097,919, Cl. 362-270.000.

Roddy, Joseph T., 4,097,706, Cl. 200-293.000.
EMI Limited: *See—*
Ingham, William Ellis; and Williams, Anthony Michael, 4,097,746, Cl. 250-444.000.
LeMay, Christopher Archibald Gordon, 4,097,744, Cl. 250-366.000.
Emmel, Leroy L. Method and apparatus for making an elongated lattice structure. 4,097,324, Cl. 156-179.000.
Emmons, William D.; and Nyi, Kayson, to Rohm and Haas Company. Unsaturated esters of glycol monodicyclopentenyl ethers. 4,097,677, Cl. 560-220.000.
Endo, Hiroshi; and Ban, Kazuhiro, to Nissan Motor Company, Limited; and Mitsubishi Denki Kabushiki Kaisha. Radar-operated vehicle safety apparatus. 4,097,864, Cl. 343-7.0VM.
Energy Absorption Systems, Inc.: *See—*
Walker, Grant W., 4,097,572, Cl. 264-310.000.
Energy Conversion Devices, Inc.: *See—*
Lewis, Gary, 4,097,846, Cl. 340-146.30H.
Engel, Paul Richard, to Upson Tools, Inc. Composite tool structure. 4,096,896, Cl. 145-50.00B.
Engelfried, Otto: *See—*
Kerb, Ulrich; Wiechert, Rudolf; and Engelfried, Otto, 4,097,678, Cl. 560-257.000.
Engelsmann, Dieter, to AGFA-Gevaert AG. Multiple lens camera having lens-position controlled focal-length adjustment. 4,097,882, Cl. 354-197.000.
Engineering Systems Corporation: *See—*
Miller, Albert J., 4,097,809, Cl. 325-54.000.
England, Robert C. Device for inserting and removing contact lenses. 4,097,081, Cl. 294-1.0CA.
Eppe, Rudolf: *See—*
Mannhardt, Annemarie; Eppe, Rudolf; and Pfeifer, Josef, 4,097,280, Cl. 96-44.000.
Epsilon Lambda Electronics Corp.: *See—*
Knox, Robert M.; and Toulios, Peter P., 4,097,826, Cl. 333-73.00R.
Epworth, Richard Edward: *See—*
Selway, Peter Richard; Chown, Martin; Epworth, Richard Edward; Leggett, Norman Derek; and Sunak, Harish Ram Dass, 4,097,891, Cl. 357-81.000.
Erickson, Frederick E.: *See—*
Ritzenthaler, Donald R.; and Erickson, Frederick E., 4,097,832, Cl. 335-166.000.
Erickson, Kent E., to Keuffel & Esser Company. Zero index for electro-optical measuring device. 4,097,734, Cl. 250-237.00G.
Erie Technological Products, Inc.: *See—*
Dorrian, John F., 4,097,911, Cl. 361-305.000.
Erikson, Carl A.; Fielding, John O.; Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Furnace for practising temperature gradient zone melting. 4,097,226, Cl. 432-120.000.
Eroncig, James Joseph. Helical antenna encased in fiberglass body. 4,097,867, Cl. 343-715.000.
Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik: *See—*
Langenbach, Erwin; and Sackmann, Karl-Hans, 4,097,733, Cl. 250-221.000.
Escher, Balint: *See—*
Moulin, Jean-Claude; Escher, Balint; and Prince, Dominique, 4,097,415, Cl. 252-512.000.
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Greeneich, Edwin W.; and Escott, William S., 4,096,821, Cl. 118-10.000.
ESEF Co.: *See—*
Frey, Nancy R.; and Schieber, Shirley, 4,096,929, Cl. 190-42.000.
Eshelman, Larry J.; and Bish, James R., to General Motors Corporation. Method of coiling a flat strip. 4,096,724, Cl. 72-132.000.
Essebaggers, Jan, to B.V. Neratoom. Method for sealing leaking pipes and repair unit for use in the method. 4,096,885, Cl. 138-97.000.
Etablissements Francois et Fils: *See—*
Salomon, Georges Pierre Joseph, 4,097,062, Cl. 280-618.000.
Ethyl Corporation: *See—*
Marsee, Frederick J., 4,096,843, Cl. 123-179.00A.
Eucatex, S.A.: *See—*
Sanz Hernandez, Jose Antonio; and Netto, Cassiano Mesquita, 4,097,635, Cl. 428-172.000.
Evans, John Brian, to Xerox Corporation. Adaptive equalizer with improved distortion analysis. 4,097,806, Cl. 325-42.000.
Evans, John James Alexander; and Holan, George, to Commonwealth Scientific and Industrial Research Organization. Triazoles. 4,097,599, Cl. 424-263.000.
Evans, Sandra R.: *See—*
Dolhyj, Serge R.; Milberger, Ernest C.; and Evans, Sandra R., 4,097,501, Cl. 260-346.740.
Evensen, Harald Thiis; and Tellesbo, Ola, to Isda Fabrikker A/S. Inorganic raw felt intended for the production of roof felt. 4,097,644, Cl. 428-281.000.
Evers, William J.; Heinsohn, Howard H., Jr.; Shuster, Edward J.; and Schmitt, Frederick Louis, to International Flavors & Fragrances, Inc. Soaps and detergents containing alpha-oxy(oxo)sulfides as perfumes. 4,097,396, Cl. 252-132.000.
Evers, William J.; and Heinsohn, Howard H., Jr., to International Flavors & Fragrances Inc. Alpha-oxy(oxo)sulfides and ethers. 4,097,532, Cl. 260-590.00D.
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. Flavoring with 3-propylthio-4-heptanol. 4,097,615, Cl. 426-535.000.
Evinrude, Ralph S., to Outboard Marine Corporation. Marine propulsion device including propeller protection means. 4,096,819, Cl. 115-17.000.
Exner, Josef: *See—*
Drobnik, Jaroslav; Kopecek, Jindrich; Labsky, Jiri; Rejmanova, Pavla; Exner, Josef; and Kalal, Jaroslav, 4,097,470, Cl. 260-78.00A.
Exxon Research & Engineering Co.: *See—*
Gladrow, Elroy M., 4,097,410, Cl. 252-455.00Z.
Eyrick, Theodore B.; Brown, Allen C.; and Hattes, Neil R., to Chemetron Corporation. Volume-rate respirator system and method. 4,096,858, Cl. 128-145.600.
Face, Samuel A., Jr. Mixer paddle shaft assembly. 4,097,926, Cl. 366-46.000.
Factor, Arnold; MacLaury, Michael R.; and Webb, Jimmy L., to General Electric Company. Dehydrochlorination of a dihydroxydiphenyl trichloroethane. 4,097,538, Cl. 568-726.000.
Fagan, James J.; Otto, William F.; and McKnight, William B., to United States of America, Army. Missile guidance system utilizing polarization. 4,097,007, Cl. 244-3.110.
Fairchild Camera and Instrument Corp.: *See—*
Walsh, Lloyd R., 4,097,885, Cl. 357-24.000.
Falk, Robert Allan: *See—*
Dear, Robert Ernest Arthur; and Falk, Robert Allan, 4,097,642, Cl. 428-262.000.
Fancher, Llewellyn W., to Stauffer Chemical Company. Alkyl thiourea miticides. 4,097,605, Cl. 424-322.000.
Farooq, Saleem; and Karrer, Friedrich, to CIBA-GEIGY Corporation. Dioxolane derivatives. 4,097,581, Cl. 424-278.000.
Farr, James B., to Tecumseh Products Company. Short pitch alternator. 4,097,754, Cl. 310-67.00R.
Farrell, Robert C.: *See—*
Goodrich, Stanley R., Jr.; Skolnik, David J.; Stearns, Joseph A.; Farrell, Robert C.; Brezinski, Richard R.; and Parks, Robert R., 4,097,057, Cl. 280-96.100.
Faser Industries: *See—*
Daly, William P.; Lewis, Robert P.; and Pouliot, Oliver L., 4,097,236, Cl. 23-230.00L.
Faudemay, Edmond L. J., to S.T. Dupont. Adjustment device for liquefied gas lighters. 4,097,222, Cl. 431-143.000.
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Levine, Marshall S.; and Faulkner, Albert A., 4,096,824, Cl. 118-100.000.
Faulkner, Philip George, to British Petroleum Company Limited, The. Forming process. 4,096,815, Cl. 113-120.00A.
Faxvog, Frederick R.: *See—*
Lewis, Robert W.; Joseph, Bernard W.; and Faxvog, Frederick R., 4,097,750, Cl. 250-548.000.
Fedders Corporation: *See—*
Nelson, James K., 4,096,602, Cl. 16-85.000.
Feldman, Keiva, to Her Majesty the Queen as represented by the Minister of National Defence of Her Majesty's Canadian Government. Battery self-discharge indicator. 4,097,803, Cl. 324-29.500.
Felix, Ernst, to Zellweger, Ltd. Method and apparatus for the two-way transmission of pulses. 4,097,692, Cl. 179-2.50R.
Fellowes Manufacturing Company: *See—*
Klaus, Gerald R., 4,096,603, Cl. 16-110.00R.
Felten & Guilleaume Carlswerk Aktiengesellschaft: *See—*
Gladenbeck, Jurgen; Muller, Gerald; Schorken, Karl; and Schwindenhammer, Hans-Peter, 4,097,686, Cl. 174-131.00A.
Fernitz, Kenneth, to Raymond Lee Organization, Inc., The, a part interest. Hammer-type tool. 4,096,895, Cl. 145-29.00R.
Feve, Lucette; and Fontaine, Remy, to Commissariat a l'Energie Atomique. Method of analysis of a sample of insulating material by photoelectronic spectrometry. 4,097,738, Cl. 250-305.000.
Fiala, Engelbert. Seismic rodent control device. 4,097,838, Cl. 340-15.000.
Fielding, John O.: *See—*
Erikson, Carl A.; Fielding, John O.; Cline, Harvey E.; and Anthony, Thomas R., 4,097,226, Cl. 432-120.000.
Fields, Virgil L., to Hobart Corporation. Bumper lock for dishwashing machine rack support. 4,097,098, Cl. 312-311.000.
Fier, Raymond L. Manhole cover support ring. 4,097,171, Cl. 404-26.000.
Figini, Mario, to Ing. C. Olivetti & C., S.p.A. Computer operator guide device. 4,097,924, Cl. 364-900.000.
Finet, Michel, to Burroughs Corporation. Apparatus for testing electrical circuit units such as printed circuit cards. 4,097,797, Cl. 324-73.00R.
Finney, James L.: *See—*
Black, Sigmund; and Finney, James L., 4,097,854, Cl. 340-282.000.
Fischell, Robert E., to Johns Hopkins University, The. Rechargeable body tissue stimulator with back-up battery and pulse generator. 4,096,866, Cl. 128-419.0PG.
Fischer, Artur; and Fischer, Klaus, to Fisher, Artur. Anchoring arrangement for securing an object to a support structure having an internal cavity. 4,096,672, Cl. 52-127.000.
Fischer, Herbert, to Metallgesellschaft Aktiengesellschaft. Production of sulfur from Claus process waste gas. 4,097,585, Cl. 423-574.00R.
Fischer, Klaus: *See—*
Fischer, Artur; and Fischer, Klaus, 4,096,672, Cl. 52-127.000.
Fischer, Thomas A., to Applied Power Inc. Strip laying apparatus. 4,097,039, Cl. 270-79.000.
Fischer, Winfried: *See—*
Elghani, Salah Elabd; Fischer, Winfried; and Prinz, Richard, 4,097,429, Cl. 260-17.00R.

Fischer, Wolfgang, to Sachs Systemtechnik. Water sterilization apparatus. 4,097,355, Cl. 204-228.000.
Fischman, Martin; and L'Hommedieu, Jesse H., to GTE Sylvania Incorporated. Quadrupole convergence circuit. 4,097,784, Cl. 315-368.000.
Fisher, Artur: *See—*
Fischer, Artur; and Fischer, Klaus, 4,096,672, Cl. 52-127.000.
Fisher, Harry S., to Spider Staging, Inc. Roof support system for a suspended staging. 4,096,922, Cl. 182-36.000.
Fisher, Michael Scott, to RCA Corporation. SCR trigger circuit. 4,097,770, Cl. 307-252.00J.
Fisher, Ted J. Rotary cutting tool. 4,097,181, Cl. 408-187.000.
FKF Berlin Fleischwaren-und Konserven- Fabrik Schulz & Berndt GmbH and Co., KG: *See—*
Olschewski, Hans Joachim, 4,097,318, Cl. 156-69.000.
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Fleury, George J., Jr. Incentive spirometer. 4,096,855, Cl. 128-2.080.
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Pearson, George R., 4,096,596, Cl. 5-360.000.
Flohr, Georg: *See—*
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Florek, James J., to Ford Motor Company. Louvered exhaust port liner. 4,096,690, Cl. 60-282.000.
Florian, John, to Mobil Oil Corporation. Food tray with integral lock. 4,096,986, Cl. 229-44.00R.
Flynn, Jean Louis. Window locking apparatus. 4,097,079, Cl. 292-239.000.
FMC Corporation: *See—*
Garber, Arnold L.; and Cremer, Hans H., 4,097,156, Cl. 356-152.000.
Lill, Melvin H., 4,097,157, Cl. 356-152.000.
Peake, Clinton Joseph; Harnish, Wayne Nelson; and Davidson, Bruce Lloyd, 4,097,594, Cl. 424-246.000.
Slattery, Gerald Holmes, 4,097,520, Cl. 260-502.00A.
Focht, Bruce E., to Scott Paper Company. Perforated, embossed film to foam laminates having good acoustical properties and the process for forming said. 4,097,633, Cl. 428-138.000.
Foley, Kevin M.; Dewhurst, Harold A.; and McCombs, Frank P., to Owens-Corning Fiberglas Corporation. Wall construction. 4,097,568, Cl. 264-216.000.
Fontaine, Remy: *See—*
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Ford Motor Company: *See—*
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Foresight Industries: *See—*
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Forgue, Stanley V.: *See—*
Bain, George W., Jr.; Forgue, Stanley V.; and Morris, Albert G., 4,097,775, Cl. 313-388.000.
Forney, Edgar Wilmot, Jr.; and Hogendobler, Richard Shure, to AMP Incorporated. Method of forming port hole coaxial connector. 4,096,627, Cl. 29-628.000.
Forsen, George E.; and Jackson, Stephen F., to Scan-Optics, Inc. Multi-font optical character recognition apparatus. 4,097,847, Cl. 340-146.3AE.
Forster, Terence Owen. Nozzle insert for a turbine. 4,097,188, Cl. 415-202.000.
Fox, William B.: *See—*
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Francis, Ralph M., Jr., to Milwaukee Resistor Corporation. Means for distinguishing motion from noise in an intrusion alarm system. 4,097,853, Cl. 340-258.00A.
Frantz, Virgil L., to Graham-White Sales Corporation. Method for decontaminating compressed gas. 4,097,248, Cl. 55-33.000.
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Freeman, David Lewis; and Flemons, Ralph Seymour, to Canadian General Electric Company Limited. Cross-correlator circuit. 4,097,801, Cl. 324-188.000.
Freeman, Thomas Edward: *See—*
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Frey, Christoph: *See—*
von Zelewsky, Alexander; Frey, Christoph; and L'Eplattenier, Francois, 4,097,484, Cl. 260-299.000.
Frey, Nancy R.; and Schieber, Shirley, to ESEF Co. Multipurpose bag. 4,096,929, Cl. 190-42.000.
Freytag, Arthur H.; and Linden, James C., to Great Western Sugar Company, The. Enzymatic method of producing glucose from ethylene treated cellulose. 4,097,333, Cl. 195-33.000.
Friant, Elias Stewart. Lacrosse stick. 4,097,046, Cl. 273-96.00D.
Fried, John H.; and Harrison, Ian T., to Syntex Corporation. 2-Naphthylacetic acid derivatives. 4,097,674, Cl. 560-100.000.
Fries, Bernd, to DEMAG Kunststofftechnik Zweigniederlassung der DEMAG AG. Apparatus for feeding synthetic material to a mould. 4,097,928, Cl. 366-336.000.
Frishman, Daniel. Ceiling hook. 4,097,015, Cl. 248-339.000.
Fritz Gegauf Aktiengesellschaft, Bernina-Nahmaschinenfabrik: *See—*
Gegauf, Fritz, 4,096,812, Cl. 112-220.000.
Frizzi, John N., to General Refractories Company. Laser jet bell kiln. 4,097,715, Cl. 219-121.0LM.
Frost, William F.; Masak, Raymond J.; Baurle, Herbert F.; and Kowalski, Anthony F., to United States of America, Air Force. Multilevel sidelobe canceller. 4,097,866, Cl. 343-100.0LE.
Fry, Stephen M., to Hughes Aircraft Company. Mode locked laser range finder. 4,097,148, Cl. 356-5.000.
Frye, Lonnie E.: *See—*
Cheris, Albert B.; and Frye, Lonnie E., 4,097,628, Cl. 428-43.000.
Fuchs, Julius Jakob, to Du Pont de Nemours, E. I., and Company. Herbicidal carbamates and thiolcarbamates. 4,097,673, Cl. 560-16.000.
Fuji Chemicals Industrial Company Limited: *See—*
Asano, Takateru; and Ito, Keiko, 4,097,283, Cl. 96-115.00R.
Fuji Photo Film Co., Ltd.: *See—*
Kondo, Toshihiro, 4,097,879, Cl. 354-106.000.
Ohtani, Sumio; Hiratsuka, Nobuo; and Horiguchi, Masaru, 4,097,383, Cl. 210-500.00M.
Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Dezawa, Shin-ichiro, 4,097,650, Cl. 428-336.000.
Tani, Tadaaki, 4,097,284, Cl. 96-126.000.
Fujii, Motoyuki; Yokota, Koji; and Yashita, Hajime, to Torio Kabushiki Kaisha. Frequency-synthesizer type transceiver. 4,097,805, Cl. 325-17.000.
Fujii, Takara: *See—*
Akiyama, Keiichi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujii, Takara, 4,097,545, Cl. 260-830.00P.
Fujikura, Kazuo: *See—*
Takahashi, Eikichi; Taguchi, Toshihiko; Fujikura, Kazuo; and Sudo, Toshihisa, 4,097,266, Cl. 75-0.50R.
Fujimoto, Sakae, to Ricoh Company, Ltd. Sheet feeding apparatus. 4,097,041, Cl. 271-114.000.
Fujimura, Noriaki, to Fujitsu Limited. Automatic equalizing method and system. 4,097,807, Cl. 325-42.000.
Fujita, Hiroshi: *See—*
Miki, Tosaku; Hosokawa, Yasuhiro; Miwa, Tamotsu; Fujita, Hiroshi; Asano, Masahide; and Aibara, Shunzo, 4,097,608, Cl. 424-324.000.
Fujita, Norihiko: *See—*
Tamura, Takaaki; Fujita, Norihiko; Matsuura, Chihiro; Ito, Wataru; and Negishi, Naoki, 4,097,576, Cl. 423-239.00A.
Fujitsu Limited: *See—*
Fujimura, Noriaki, 4,097,807, Cl. 325-42.000.
Fujiwara, Minoru: *See—*
Horikiri, Kazuhito; Hirasawa, Hiroshi; and Fujiwara, Minoru, 4,096,769, Cl. 74-801.000.
Fukai, Toshio: *See—*
Muramatsu, Tateo; Fukai, Toshio; and Takahashi, Haruo, 4,096,700, Cl. 61-1.00F.
Fukuda, Kazumasa: *See—*
Tokuoka, Yasumichi; Fukuda, Kazumasa; and Hosaka, Akihiko, 4,097,313, Cl. 148-105.000.
Fukumoto, Ichiro; and Hayashida, Susumu, to Sankyo Special Steel Co., Ltd. Side wall of the ultra high power electric arc furnaces for steelmaking. 4,097,679, Cl. 13-32.000.
Fuller, Ronald E. Building structural system. 4,096,670, Cl. 52-90.000.
Fulmer, Leon F., Sr.; and Lewis, John R., Jr., to Shakespeare Company. Active sleeve surrounding feed line for dipole antenna. 4,097,870, Cl. 343-792.000.
Fumishi, Michio: *See—*
Takahashi, Masaoki; and Fumishi, Michio, 4,097,233, Cl. 8-83.000.
Furbee, Avery D.; Kasten, Roy F., Jr.; and Pleil, Viktor W., to Picker Corporation. X-ray tube. 4,097,759, Cl. 313-60.000.
Furbee, Avery D.; and Cinelli, Gabriel, to Picker Corporation. X-ray tube having bearing lubrication. 4,097,760, Cl. 313-60.000.
Furey, Robert J.; and Stupay, Lawrence J., to Bunker Ramo Corporation. Electrical connection system. 4,097,104, Cl. 339-74.00R.
Furuhashi, Nobuo: *See—*
Seki, Chichitada; and Furuhashi, Nobuo, 4,097,561, Cl. 261-41.00D.
Furukawa Electric Co., Ltd., The: *See—*
Shimokawa, Hayao; Nakamuri, Makoto; Ueno, Hideyo; Namiki, Isamu; and Shiina, Naonori, 4,097,319, Cl. 156-79.000.
Furukawa, Mureo. Container. 4,096,975, Cl. 222-552.000.
Futcher, Ralph James, to Dominion Engineering Works Limited. Paper web streak drying system. 4,096,643, Cl. 34-122.000.
Gabel, Friedrich: *See—*
Tack, Albert; and Gabel, Friedrich, 4,097,078, Cl. 292-216.000.
Gahrs, James S., to General Motors Corporation. Closure latch. 4,097,077, Cl. 292-216.000.
Gallagher, Peter C. J.: *See—*
Rao, Mannige Vikram; Coyle, Bernard H., Jr.; and Gallagher, Peter C. J., 4,097,270, Cl. 75-68.00R.
Gallagher, Ruth E.; and Goswami, Jagadish C., to Stauffer Chemical Company. Low fusion copolymer comprising vinyl chloride, vinyl acetate, and bis(hydrocarbyl)vinylphosphonate. 4,097,663, Cl. 526-278.000.
Gallati, Fritz: *See—*
Bartels, Hermann; Gallati, Fritz; Lang, Karl; and Rutishauser, Heinz, 4,096,972, Cl. 222-135.000.

Galloway, Richard M.: *See*—
Brungard, Alvin J.; Galloway, Richard M.; and Kerwick, Donald P., 4,096,614, Cl. 29-156.80R.
Garavaglia, Marco F. Chair with adjustable back support cushion. 4,097,087, Cl. 297-284.000.
Garber, Arnold L.; and Cremer, Hans H., to FMC Corporation. Real-time system for automatically measuring the performance of weapons. 4,097,156, Cl. 356-152.000.
Gardner, Derek Victor, to Beecham Group Limited. 2,2-Dimethyl-7-amine-alkoxy-4-aryltetra-hydroquinaline derivatives. 4,097,480, Cl. 260-286.00R.
Gardner, Jeffrey M., to Container Corporation of America. Internal partition arrangement. 4,096,984, Cl. 229-15.000.
Gardner, Keith L., to United States of America, Navy. Fourier power spectra of optical images using CCD's. 4,097,749, Cl. 250-550.000.
Gardner, Sylvia Alice; and Lelental, Mark, to Eastman Kodak Company. Heat developable photographic material and process comprising transition metal carbonyl compounds. 4,097,281, Cl. 96-48.0HD.
Gardner, William H.; Graham, Donald H.; and Williams, George M., to Hercules Incorporated. Magnetic orientation of casting powder granules. 4,097,315, Cl. 149-2.000.
Gardner, Willis W., to Waukesha Bearings Corporation. Journal bearing assembly with flexible support and viscous damping. 4,097,094, Cl. 308-9.000.
Gargaillo, Daniel Pierre. Punching, stamping and rivetting apparatus. 4,096,727, Cl. 72-312.000.
Garkusha, Olga Ivanovna: *See*—
Rivkin, Ilya Yakovlevich; Aisin, Shamil Mustafovich; Garkusha, Olga Ivanovna; Dondoshansky, Alexandr Lvovich; Zellis, Evgeny Alfredovich; Karpov, Vladilen Efremovich; Sorokin, Vladimir Konstantinovich; and Shishkin, Oleg Petrovich, 4,096,745, Cl. 73-194.00B.
Garner, David, to Coal Industry (Patents) Limited. Conveying apparatus. 4,096,940, Cl. 198-560.000.
Garner, Eugene F.; and Hamilton, Brian K., to Allied Chemical Corporation. Pyrotechnic tire inflator. 4,097,241, Cl. 23-281.000.
Garnier, John J., to Cutler-Hammer, Inc. Flash-tube ignition system. 4,097,223, Cl. 431-191.000.
Garnier, Robert C., Sr. Feed-back communication card. 4,097,068, Cl. 283-5.000.
Garrett Corporation, The: *See*—
Six, Lyle D., 4,097,276, Cl. 75-208.00R.
Garrick, John R.; and Kottmeyer, Richard E., to Armstrong Cork Company. Apparatus for forming a mineral wool fiberboard product. 4,097,209, Cl. 425-82.100.
Garwin, Richard Lawrence; and Levine, James Lewis, to International Business Machines Corporation. Optical scanning device for producing a multiple line scan using a linear array of sources and a textured scanned surface. 4,097,115, Cl. 350-6.700.
Gaskin, Raymond Lester. Refuse vehicle. 4,096,956, Cl. 214-82.000.
Gasser, Oswald: *See*—
Schmidbaur, Hubert; and Gasser, Oswald, 4,097,509, Cl. 260-430.000.
Gates Rubber Company, The: *See*—
Stefano, Gene E.; and Tally, David N., 4,096,888, Cl. 138-125.000.
Gaub, Erwin: *See*—
Sandau, Hartmut; Weigert, Wilhelm; Steinel, Winfried; Kraisel, August; Ritter, Klaus; Gaub, Erwin; and Kochendorfer, Heinrich, 4,096,787, Cl. 92-260.000.
Gay, Charles H., Jr.: *See*—
Barack, William N.; Gay, Charles H., Jr.; Beekman, Stephen W.; and Domas, Paul A., 4,097,194, Cl. 416-244.00A.
Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H.: *See*—
Knorr, Volker, 4,097,091, Cl. 299-1.000.
Geddes, Andrew E.: *See*—
Reams, Lowell A.; and Geddes, Andrew E., 4,096,695, Cl. 60-517.000.
Gee, Thomas A., to Eaton Corporation. Tubular wheel speed sensor. 4,097,756, Cl. 310-155.000.
Gegauf, Fritz, to Fritz Gegauf Aktiengesellschaft, Bernina-Nahmaschinenfabrik. Clutching device for sewing machines. 4,096,812, Cl. 112-220.000.
Geiger, Paul B., to Hobart Corporation. Fill control for an automatic dishwasher. 4,097,307, Cl. 134-10.000.
Geimer, Michael R.: *See*—
Guevara, Humberto F.; and Geimer, Michael R., 4,096,892, Cl. 140-140.000.
Geluk, Ronald Jan, to N. V. Optische Industrie "De Oude Delft". Method and apparatus for linearly filtering two-dimensional signals. 4,097,898, Cl. 358-163.000.
General Electric Company: *See*—
Abolins, Visvaldis; and Holub, Fred F., 4,097,446, Cl. 260-40.00R.
Arendt, Ronald H.; and Curran, Matthew J., 4,097,343, Cl. 204-37.00R.
Bacharowski, Walter, 4,097,777, Cl. 315-60.000.
Baertsch, Richard D.; and Tiemann, Jerome J., 4,097,886, Cl. 357-24.000.
Bennett, James G.; and Cooper, Glenn D., 4,097,458, Cl. 260-47.0ET.
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Berger, Abe, 4,097,511, Cl. 260-448.20N.
Berkowitz, Ami E.; Lahut, Joseph A.; and Wang, Jish Min, 4,097,871, Cl. 346-74.100.
Brungard, Alvin J.; Galloway, Richard M.; and Kerwick, Donald P., 4,096,614, Cl. 29-156.80R.
Coffinberry, George A., 4,096,616, Cl. 29-157.30A.
Coffinberry, George A.; and Kast, Howard B., 4,096,910, Cl. 165-81.000.
Cole, Herbert S., Jr., 4,097,130, Cl. 350-335.000.
Cote, Paul T.; and Schupp, Lewis J., 4,097,220, Cl. 431-95.00A.
Erikson, Carl A.; Fielding, John O.; Cline, Harvey E.; and Anthony, Thomas R., 4,097,226, Cl. 432-120.000.
Factor, Arnold; MacLaury, Michael R.; and Webb, Jimmy L., 4,097,538, Cl. 568-726.000.
Grubb, Willard T., 4,097,402, Cl. 252-301.10R.
Haaf, William Robert; Lee, Gim Fun, Jr.; 260; and 260, 4,097,550, Cl. 260-876.00B.
Herbst, LeRoy J.; and Jenkins, Thomas E., 4,096,872, Cl. 134-105.000.
Huseby, Irvin C.; and Klug, Frederic J., 4,097,291, Cl. 106-38.900.
Huseby, Irvin C.; and Klug, Frederic J., 4,097,292, Cl. 106-38.900.
Jencks, Charles L.; and Castonguay, Roger N., 4,097,831, Cl. 335-166.000.
Jenkins, Kenneth W., 4,097,758, Cl. 310-178.000.
Kalkbrenner, Francis William, 4,097,887, Cl. 357-38.000.
Krause, Werner A., 4,097,103, Cl. 339-22.00B.
Morris, Edwin Earl, 4,097,897, Cl. 358-162.000.
Neissel, John P.; Hendon, Harry H.; and Terhune, James H., 4,097,330, Cl. 176-19.00R.
Niznik, George E., 4,097,425, Cl. 260-2.50N.
Niznik, George E., 4,097,671, Cl. 544-66.000.
Olander, Walter Karl, 4,097,462, Cl. 260-47.0ET.
Parks, Harold G., 4,097,745, Cl. 250-398.000.
Stoner, Jesse A., 4,096,905, Cl. 164-51.000.
Usry, Gerald O., 4,097,852, Cl. 340-242.000.
van Sorge, Bernardus J., 4,097,+11, Cl. 252-457.000.
General Foods France, S.A.: *See*—
Guillou, Jean Pierre; and Letourneau, Georges, 4,097,616, Cl. 426-548.000.
General Mills, Inc.: *See*—
Weiss, Verne E.; Campbell, Glenn M.; and Wilson, Gerald L., 4,096,791, Cl. 99-353.000.
General Motors Corporation: *See*—
Crawford, Daniel G.; James, Stanley E.; and Nixon, Donald H., 4,097,071, Cl. 285-94.000.
Cross, Kenneth R., 4,096,615, Cl. 29-156.80R.
Cross, William E., 4,097,109, Cl. 339-147.00R.
Cymbal, William D., 4,096,717, Cl. 70-248.000.
Dupler, William W., 4,096,729, Cl. 72-350.000.
Eshelman, Larry J.; and Bish, James R., 4,096,724, Cl. 72-132.000.
Gahrs, James S., 4,097,077, Cl. 292-216.000.
Goodrich, Stanley R., Jr.; Skolnik, David J.; Stearns, Joseph A.; Farrell, Robert C.; Brezinski, Richard R.; and Parks, Robert R., 4,097,057, Cl. 280-96.100.
Halsted, Edwin H., 4,097,702, Cl. 200-153.0LB.
Hawkins, Harold G., 4,097,107, Cl. 339-97.00R.
Hullinger, Lee, Jr.; and Noble, Leo E., 4,097,811, Cl. 325-470.000.
Huntzinger, Gerald O.; Buck, Charles E.; and Campbell, Robert E., 4,096,735, Cl. 73-35.000.
Kell, Nathaniel B., 4,096,763, Cl. 74-69.000.
Kindermann, Joseph C.; and Colling, Ronald L., 4,096,841, Cl. 123-148.00E.
Klomp, Edward D., 4,096,995, Cl. 239-94.000.
Kochendorfer, Donald P., 4,097,096, Cl. 312-214.000.
Kopich, Leonard F., 4,096,836, Cl. 123-90.150.
Lewis, Robert W.; Joseph, Bernard W.; and Faxvog, Frederick R., 4,097,750, Cl. 250-548.000.
MacIver, Bernard A., 4,096,622, Cl. 29-578.000.
Palmer, Walter E., 4,097,204, Cl. 418-19.000.
Petry, Ronald G., 4,097,080, Cl. 293-85.000.
Van House, Robert M., 4,096,696, Cl. 60-547.000.
White, Robert F., 4,097,011, Cl. 248-5.000.
Wilson, Robert J., 4,097,790, Cl. 318-471.000.
General Refractories Company: *See*—
Frizzi, John N., 4,097,715, Cl. 219-121.0LM.
General Research of Electronics, Inc.: *See*—
Imazeki, Kazuyoshi; and Kazami, Koichi, 4,097,816, Cl. 331-2.000.
General Signal Corporation: *See*—
Sibley, Henry C., 4,097,764, Cl. 307-200.00A.
Soler, Norman V.; and DeSisto, Richard E., 4,097,722, Cl. 219-368.000.
General Time Corporation: *See*—
Rigazio, Anthony W., 4,097,757, Cl. 310-162.000.
Genest, Leonard J.; and Messner, Daryle, to Monitron Industries. Apparatus for providing and sensing coded information. 4,097,728, Cl. 235-439.000.
Genik-Sas-Berezowsky, Roman Michael: *See*—
Swinkels, Godefridus M.; Milner, Edward F. G.; and Genik-Sas-Berezowsky, Roman Michael, 4,097,271, Cl. 75-104.000.
Gentsch, C. Stewart, to Rexnord Inc. Snap-on top plate assembly. 4,096,943, Cl. 198-793.000.
Genuardi, Bennie, to Navarre, Irving. Outboard hub. 4,097,191, Cl. 416-170.00R.
Geosource Inc.: *See*—
Hoover, Michael C.; and Long, William C., 4,096,949, Cl. 209-74.00M.
Gerard, Henry M., to Hughes Aircraft Company. Surface acoustic wave tapped delay line. 4,097,825, Cl. 333-30.00R.
Gerelli, Fausto: *See*—
Balducci, Luigi; Sarti, Dino; and Gerelli, Fausto, 4,097,300, Cl. 106-299.000.

Gerlach, Gijsbertus; and Kelly, John Joseph, to U.S. Philips Corporation. Etching liquid for etching aluminum. 4,097,394, Cl. 252-79.500.

Gerlach-Werke GmbH: *See*—
Prowald, Oswald, 4,097,219, Cl. 431-90.000.

Gersch, Richard C. Cutting tool holder. 4,097,179, Cl. 408-151.000.

Gesellschaft fur Kernforschung m.b.H.: *See*—
Guber, Walter; Saidl, Jaroslav; Daruschy, Paul; and Hild, Werner, 4,097,401, Cl. 252-301.10W.

Geske, Bruce R., to UOP Inc. Channel base well screen. 4,096,911, Cl. 166-234.000.

Gibbons, John Francis; and McLaughlin, Daniel John, to Combustion Engineering, Inc. Holddown structure for a nuclear reactor core. 4,097,332, Cl. 176-87.000.

Gietema, Jouke: *See*—
Brands, Antoon Hendrikus; Gietema, Jouke; and Bleijerveld, Hendrik Cornelis, 4,097,848, Cl. 365-118.000.

Gilb, Tyrell T., to Simpson Manufacturing Co., Inc. Post base. 4,096,677, Cl. 52-297.000.

Gillette Company, The: *See*—
Muller, Frank Andrew; and Peper, Henry, Jr., 4,097,290, Cl. 106-30.000.

Gilmore, Charles L. Haystack mover control means. 4,096,960, Cl. 214-505.000.

Gilson, John L.: *See*—
Moschovis, Elias P.; and Gilson, John L., 4,097,391, Cl. 252-62.10L.

Gilson, Paul R. Digital output, positive displacement flow meter. 4,096,747, Cl. 73-251.000.

Ginatta, Marco V. Continuous process for electrolytic refining and electrowinning of elements and compounds. 4,097,354, Cl. 204-206.000.

Giordano, Francis Peter; and Hendriks, Ferdinand, to International Business Machines Corporation. Axial droplet aspirator. 4,097,872, Cl. 346-75.000.

Girault, Pierre: *See*—
Perronnet, Jacques; Girault, Pierre; and Bonne, Claude, 4,097,578, Cl. 424-273.00R.

Giroux, Victor A., to Phillips Petroleum Company. Separation of fluid mixtures. 4,097,371, Cl. 208-313.000.

Giulie, Joe D.; and Worcester, Leslie E., to Permax. Power actuated laminating machine. 4,097,326, Cl. 156-366.000.

GKN-Stenman AB: *See*—
Tranberg, Erik Rudolf, 4,096,719, Cl. 70-450.000.

GKN Transmissions Limited: *See*—
Webb, Oswald, 4,096,712, Cl. 64-26.000.

Gladenbeck, Jurgen; Muller, Gerald; Schorken, Karl; and Schwindenhammer, Hans-Peter, to Felten & Guilleaume Carlswerk Aktiengesellschaft. Open-air or overhead transmission cable of high tensile strength. 4,097,686, Cl. 174-131.00A.

Gladrow, Elroy M., to Exxon Research & Engineering Co. Hydrocarbon conversion catalyst containing a CO oxidation promoter. 4,097,410, Cl. 252-455.00Z.

Glecker, Donald Leroy; Roth, John F.; and Bosch, Peter N., to Gulf & Western Manufacturing Company. Adjusting device for slide driven lift out actuators. 4,096,728, Cl. 72-345.000.

Glen Head, Inc.: *See*—
Negola, Edward J.; and Brown, Jerald, 4,097,232, Cl. 8-65.000.

Glick, Earl. Universal electrical outlet box and method of installing. 4,096,964, Cl. 220-3.400.

Glory Kogyo Kabushiki Kaisha: *See*—
Iguchi, Masayuki, 4,096,991, Cl. 235-419.000.

Goldberg, Robert M.; and O'Connor, John R. Board game apparatus. 4,097,051, Cl. 273-254.000.

Goldman, Alex; and Laing, Alfred M., to Spang Industries, Inc. Coprecipitation methods and manufacture of soft ferrite materials and cores. 4,097,392, Cl. 252-62.620.

Goldstein, Morton I., to Matrix Groups, Inc. Adjustable eye shade. 4,096,589, Cl. 2-12.000.

Gole, Jean: *See*—
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan Martinov; Pascault, Jean-Pierre; Pham, Quang Tho; Pillot, Christian; and Salle, Robert, 4,097,660, Cl. 526-173.000.

Golembeck, Gerald A.: *See*—
Eide, Richard H.; and Golembeck, Gerald A., 4,096,595, Cl. 5-345.00R.

Golias, Tipton L.; and Mayes, David, to Helena Laboratories Corporation. Apparatus for applying an organic liquid sample. 4,096,825, Cl. 118-221.000.

Gollinger, Wolfgang, to ITT Industries, Incorporated. Integrated clock pulse shaper. 4,097,771, Cl. 307-268.000.

Gomberg, Henry J., to Texas Gas Transmission Corporation. Method and apparatus for producing hydrogen. 4,097,348, Cl. 204-157.10H.

Goodman, Herb Lou: *See*—
Lieberman, Frank David; and Goodman, Herb Lou, 4,097,725, Cl. 235-92.0PK.

Goodrich, Stanley R., Jr.; Skolnik, David J.; Stearns, Joseph A.; Farrell, Robert C.; Brezinski, Richard R.; and Parks, Robert R., to General Motors Corporation. Independent suspension system. 4,097,057, Cl. 280-96.100.

Goodyear Tire & Rubber Company, The: *See*—
Chang, Tai Ming, 4,097,421, Cl. 260-2.50N.
Cole, Clarence R.; and Duncan, Robert L., 4,097,565, Cl. 264-40.300.
Cunningham, Robert E., 4,097,557, Cl. 260-880.00B.
Kelly, Emmett J.; and Smith, Leonard R., 4,097,321, Cl. 156-136.000.
Kieft, Alvin J.; Cline, Richard L.; and Rabito, Thomas G., 4,097,442, Cl. 260-37.00N.
Kline, Richard H., 4,097,464, Cl. 260-62.000.
Kline, Richard H., 4,097,527, Cl. 260-570.80R.
Kulkarni, Mohan V.; and Von Kamp, John, 4,097,548, Cl. 260-873.000.
Maximovich, Michael J.; and Burroway, Gary L., 4,097,440, Cl. 260-31.40R.
Olsen, Richard J., 4,096,900, Cl. 152-354.00R.

Goswami, Jagadish C.: *See*—
Gallagher, Ruth E.; and Goswami, Jagadish C., 4,097,663, Cl. 526-278.000.

Goto, Toshiyuki: *See*—
Yamada, Akitoshi; Goto, Toshiyuki; Kimura, Yoichi; and Kikuchi, Yoshinobu, 4,097,689, Cl. 179-1.00G.

Gotoh, Astuko: *See*—
Sohde, Takeshi; Gotoh, Astuko; Iwamoto, Kuniharu; and Okamoto, Yasushi, 4,097,234, Cl. 8-94.190.

Gouw, Hoan Giok: *See*—
DeVos, Marc Francois; and Gouw, Hoan Giok, 4,097,049, Cl. 273-153.00S.

Goverde, Bastiaan Cornelis: *See*—
Konttinen, Aarne Ilmari; Goverde, Bastiaan Cornelis; and Janssen, Peter Silvester Lambertus, 4,097,338, Cl. 195-103.50R.

Grace, Alan G. V.; and Wong, Janet C. Asynchronous addressable multiplex system. 4,097,695, Cl. 179-15.0BA.

Grafalloy Corporation: *See*—
Tennent, Richard Lee, 4,097,626, Cl. 428-36.000.

Graff, Renier J. L.: *See*—
Creemers, Henricus M. J. C.; Graff, Renier J. L.; and Verschoor, Hendrinus M., 4,097,659, Cl. 526-151.000.

Graham, Donald H.: *See*—
Gardner, William H.; Graham, Donald H.; and Williams, George M., 4,097,315, Cl. 149-2.000.

Graham, Francis E.: *See*—
Treiber, Fritz F.; and Graham, Francis E., 4,096,968, Cl. 220-314.000.

Graham-White Sales Corporation: *See*—
Frantz, Virgil L., 4,097,248, Cl. 55-33.000.

Grapes, Eugene F.: *See*—
Patterson, W. W., III; and Grapes, Eugene F., 4,096,816, Cl. 114-75.000.

Gray, Alden J.; Sanderson, Ian S.; and Hardy, John C., to Maremont Corporation. Method of making a variable reluctance A.C. electrical generator. 4,096,624, Cl. 29-596.000.

Graystone Corporation: *See*—
Allmer, Franz, 4,096,806, Cl. 104-12.000.

Great Western Sugar Company, The: *See*—
Freytag, Arthur H.; and Linden, James C., 4,097,333, Cl. 195-33.000.

Greefkes, Johannes Anton, to U.S. Philips Corporation. Switching system for an automatic telecommunication exchange with a plurality of intermediate lines that are grounded when not in use. 4,097,693, Cl. 179-15.0AT.

Green, Philip S., to SRI International. Dual transducer arrangement for ultrasonic imaging system. 4,097,835, Cl. 340-1.00R.

Green, Ray: *See*—
Schimming, Fred H., 4,096,638, Cl. 33-396.000.

Greene, David James; and Pearson, Colin Alfred, to BICC Limited. Manufacture of rigid elongate members of resin bonded reinforcing elements. 4,097,322, Cl. 156-149.000.

Greeneich, Edwin W.; and Escott, William S., to Westinghouse Electric Corp. System for fabricating thin-film electronic components. 4,096,821, Cl. 118-10.000.

Greve, Mogens: *See*—
Brauer, Harald Otto Christian; Jensen, Knud Sejr; Andreasen, Torben; Jensen, Hilmer; Greve, Mogens; and Kurstein, Peter, 4,097,320, Cl. 156-109.000.

Griffin, Phil Harmon: *See*—
Phillips, Victor Quin; Griffin, Phil Harmon; and Sharki, Martin James, 4,097,249, Cl. 55-41.000.
Phillips, Victor Quin; Griffin, Phil Harmon; and Sharki, Martin James, 4,097,253, Cl. 55-169.000.

Gross, Stanley Joseph, to Biological Developments, Inc. Immunochemical assay method. 4,097,586, Cl. 424-1.000.

Grossi, Mario D.: *See*—
Colombo, Giuseppe; and Grossi, Mario D., 4,097,010, Cl. 244-158.000.

Groth, Hugh F., to True Temper Corporation. Ground working apparatus with tools to draw the apparatus forward. 4,096,915, Cl. 172-42.000.

Grubb, Willard T., to General Electric Company. Nuclear fuel assembly and process. 4,097,402, Cl. 252-301.10R.

Grumman Aerospace Corporation: *See*—
Egan, Walter G.; Hallock, Herbert B.; and Hilgeman, Theodore W., 4,097,751, Cl. 250-571.000.
Witzke, Horst, 4,097,655, Cl. 429-111.000.

GTE Laboratories Incorporated: *See*—
Wellington, Charles K.; and Dakss, Mark L., 4,097,129, Cl. 350-96.150.

GTE Sylvania Incorporated: *See*—
Cosco, Robert J.; Lo, John M.; and Hebert, Roger T., 4,097,774, Cl. 313-178.000.
Fischman, Martin; and L'Hommedieu, Jesse H., 4,097,784, Cl. 315-368.000.
Latassa, Frank M., 4,097,779, Cl. 315-106.000.

Shaffer, John W.; and Audesse, Emery G., 4,097,221, Cl. 431-95.00R.
Guazzoni, Guido Eddardo, to United States of America, Army. Thermal shunt for radioisotope thermoelectric generator-chemical battery hybrid configuration. 4,097,654, Cl. 429-5.000.
Guber, Walter; Saidl, Jaroslav; Daruschy, Paul; and Hild, Werner, to Gesellschaft fur Kernforschung m.b.H. Thermodynamically stable product for permanent storage and disposal of highly radioactive liquid wastes. 4,097,401, Cl. 252-301.10W.
Gudel, Alfred. Method and device for the measurement of angles on space planes. 4,096,634, Cl. 33-75.00C.
Guerard, Daniel: *See—*
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan Martinov; Pascault, Jean-Pierre; Pham, Quang Tho; Pillot, Christian; and Salle, Robert, 4,097,660, Cl. 526-173.000.
Guerreri, Gianfranco: *See—*
Pagani, Giorgio; Guerreri, Gianfranco; and Peri, Bruno, 4,097,250, Cl. 55-48.000.
Guevara, Humberto F.; and Geimer, Michael R., to International Telephone & Telegraph Corporation. Rigid coaxial cable cutting and scoring machine. 4,096,892, Cl. 140-140.000.
Guienne, Paul Francois. Vehicle supported by an air cushion. 4,096,921, Cl. 180-121.000.
Guillou, Jean Pierre; and Letourneau, Georges, to General Foods France, S.A. Low temperature soft candy process. 4,097,616, Cl. 426-548.000.
Gulf Oil Corporation: *See—*
Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., 4,097,448, Cl. 260-42.180.
Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., 4,097,449, Cl. 260-42.180.
Kirkpatrick, Joel L., 4,097,263, Cl. 71-90.000.
Kirkpatrick, Joel L.; and Doyle, Jr.; William C., 4,097,264, Cl. 71-90.000.
Gulf Research & Development Company: *See—*
Barie, Walter P., Jr., 4,097,456, Cl. 260-47.0UA.
McKinney, Joel Drexler; Sebulsky, Raynor T.; and Wynne, Francis Edmund, Jr., 4,097,362, Cl. 208-78.000.
McKinney, Joel Drexler; Sebulsky, Raynor T.; and Wynne, Francis Edmund, Jr., 4,097,363, Cl. 208-78.000.
Gulf & Western Industries, Inc.: *See—*
Ritzenthaler, Donald R.; and Erickson, Frederick E., 4,097,832, Cl. 335-166.000.
Gulf & Western Manufacturing Company: *See—*
Glecker, Donald Leroy; Roth, John F.; and Bosch, Peter N., 4,096,728, Cl. 72-345.000.
Moskalik, James M., 4,096,798, Cl. 100-53.000.
Rolnick, Edward M., 4,097,182, Cl. 408-239.00R.
Gunda, Rajamouli, to Bendix Corporation, The. Frequency modulated fuel injection system. 4,096,831, Cl. 123-32.0EG.
Gunther, Gerhard: *See—*
Haeufler, Hartmut; and Gunther, Gerhard, 4,097,298, Cl. 106-243.000.
Gunther, Wolfgang H. H., to Xerox Corporation. Arsenic/selenium recovery. 4,097,273, Cl. 75-121.000.
Guolo, Giuseppe, to Calzaturificio Giuseppe Garbuio S.A.S. Ski boot fastener. 4,096,648, Cl. 36-50.000.
Gutehoffnungshutte Sterkrade A.G.: *See—*
Heinen, Manfred, 4,097,052, Cl. 277-96.200.
Guy, Richard Ernest, to Du Pont de Nemours, E. I., and Company. Dust collection device. 4,096,894, Cl. 141-93.000.
H. K. Nuttall Equipment Co . Inc.: *See—*
Raines, William L.; and Karges, John, Jr., 4,096,652, Cl. 37-41.000.
Haaf, William Robert; Lee, Gim Fun, Jr.; 260; and 260, to General Electric Company. Composition of a radial teleblock copolymer and a copolymer of a vinyl aromatic compound and an α,β unsaturated cyclic anhydride. 4,097,550, Cl. 260-876.00B.
Haag, Werner O.; and Huang, Tracy J., to Mobil Oil Corporation. Conversion of olefinic naphtha. 4,097,367, Cl. 208-135.000.
Haag, Werner O.; and Olson, David H., to Mobil Oil Corporation. Selective disproportionation of toluene. 4,097,543, Cl. 260-672.00T.
Haas, Werner E. L.; and Dir, Gary A., to Xerox Corporation. Mixed liquid crystalline texture formation. 4,097,127, Cl. 350-332.000.
Haase, Jaroslav: *See—*
Wegmuller, Hans; and Haase, Jaroslav, 4,097,376, Cl. 210-36.000.
Haber, Terry M.; and Dehlsen, James G. P. Cover assembly for spray cans. 4,096,974, Cl. 222-402.130.
Haberland, Detlef: *See—*
Breuninger, Karl; Haberland, Detlef; and Herberger, Roland, 4,097,685, Cl. 174-68.500.
Habiger, Cyril W.; and Hicks, Leon E., to Caterpillar Tractor Co. Control system for a fluid drive. 4,096,694, Cl. 60-459.000.
Habiger, Cyril W., to Caterpillar Tractor Co. Pilot operated pressure compensated pump control. 4,097,196, Cl. 417-222.000.
Hadcroft, John Mackay. Heat absorber for a solar heating system. 4,096,850, Cl. 126-271.000.
Haeufler, Hartmut; and Gunther, Gerhard, to AKZO N.V. Coating composition having a water-dilutable maleinized oil base. 4,097,298, Cl. 106-243.000.
Hagen, Floyd W.: *See—*
De Leo, Richard V.; and Hagen, Floyd W., 4,096,744, Cl. 73-180.000.
Hagen, Paul D.: *See—*
Iverson, Lowell P.; Dirscherl, George W.; and Hagen, Paul D., 4,096,957, Cl. 214-145.00R.
Haindl, Karel, to Vyzkumny ustav vodohospodarsky. Apparatus for mixing a basic liquid substance with other media. 4,097,026, Cl. 366-165.000.
Hall, Charles B., to Outboard Marine Corporation. Hydraulically powered marine propulsion tilting system with automatic let-down assembly. 4,096,820, Cl. 115-41.0HT.
Hall, John B.; Sprecker, Mark A.; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; and Novak, Robert M., to International Flavors & Fragrances Inc. 1-(2-Propenyl)-3-(4-methyl-3-pentenyl)-Δ^3-cyclohexene-1-carboxaldehyde and 1-(2-propenyl)-4-(4-methyl-3-pentenyl)-Δ^3-cyclohexene-1-carboxaldehyde, perfume compositions. 4,097,416, Cl. 252-522.000.
Hall, Walter Dennis; Miller, Merrell Thomas; and Roof, Douglas L. Tire slitting apparatus. 4,096,772, Cl. 82-82.000.
Halliburton Company: *See—*
Lawson, Michael B., 4,096,869, Cl. 134-3.000.
Hallock, Herbert B.: *See—*
Egan, Walter G.; Hallock, Herbert B.; and Hilgeman, Theodore W., 4,097,751, Cl. 250-571.000.
Halsted, Edwin H., to General Motors Corporation. Cam actuated switch. 4,097,702, Cl. 200-153.0LB.
Hamilton, Brian K.: *See—*
Garner, Eugene F.; and Hamilton, Brian K., 4,097,241, Cl. 23-281.000.
Hamlet, Buck C.: *See—*
Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 4,097,034, Cl. 267-15.00A.
Hammann, Ingeborg: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,097,592, Cl. 424-200.000.
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Homeyer, Bernhard, 4,097,593, Cl. 424-200.000.
Hammer, Jacob Meyer, to RCA Corporation. Optical waveguide coupler employing deformed shape fiber-optic core coupling portion. 4,097,118, Cl. 350-96.170.
Hammer, Jacob Meyer: *See—*
Neil, Clyde Carl; Hammer, Jacob Meyer; and Bartolini, Robert Alfred, 4,097,117, Cl. 350-96.170.
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Schroder, Martin, to Hoechst Aktiengesellschaft. Shaped article of cellulose hydrate with a coating of plastic material of chemically modified protein and process for the production thereof. 4,097,623, Cl. 427-230.000.
Hampel, Horst: *See—*
Anderka, Gerold; Hampel, Horst; Jozat, Walter; and Straszewski, Klaus, 4,097,874, Cl. 346-140.00R.
Hanakata, Takayoshi; and Mitaka, Shunji, to Canon Kabushiki Kaisha. Input device. 4,096,935, Cl. 400-479.000.
Hanlon, Richard J.: *See—*
Holt, Richard C.; Damon, Neil F.; and Hanlon, Richard J., 4,097,101, Cl. 339-17.00C.
Hanrahan, Michael John: *See—*
Noonan, John Michael; McConkey, Robert Charles; and Hanrahan, Michael John, 4,097,282, Cl. 96-73.000.
Hansen, James E.: *See—*
Zalar, David R.; and Hansen, James E., 4,097,842, Cl. 340-71.000.
Hansson, Gunnar Christer, to Atlas Copco Aktiebolag. Pressure operated valve. 4,097,184, Cl. 415-49.000.
Hara, Kunihiko: *See—*
Yamawaki, Masao; Aoki, Katsuo; Oka, Yoshio; Suzuki, Takao; Ina, Osamu; and Hara, Kunihiko, 4,096,822, Cl. 118-48.000.
Hardy, John C.: *See—*
Gray, Alden J.; Sanderson, Ian S.; and Hardy, John C., 4,096,624, Cl. 29-596.000.
Hareng, Michel: *See—*
Moutou, Paul Cyril; Hareng, Michel; and Le Berre, Serge, 4,097,142, Cl. 355-45.000.
Harlamert, W. Benjamin, to Hartzell Propeller, Inc. Aircraft propeller and blade pitch control system. 4,097,189, Cl. 416-46.000.
Harman, Stephen George, to Northern Telecom Limited. Digital signal performance monitor. 4,097,697, Cl. 179-175.30R.
Harmon's Northern Mfg., Inc.: *See—*
Nelson, Arnold Eugene, 4,097,085, Cl. 296-28.00C.
Harnish, Wayne Nelson: *See—*
Peake, Clinton Joseph; Harnish, Wayne Nelson; and Davidson, Bruce Lloyd, 4,097,594, Cl. 424-246.000.
Harris, Jesse W. Earth drilling knobby bit. 4,096,917, Cl. 175-228.000.
Harrison, Ian T.: *See—*
Fried, John H.; and Harrison, Ian T., 4,097,674, Cl. 560-100.000.
Hartigan, Richard Joseph, Jr., to Albany International Corp. Poly (ethylene oxide) monofilament. 4,097,652, Cl. 428-401.000.
Hartman, Robert J.: *See—*
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,097,399, Cl. 252-182.000.
Hartman, Russell E.: *See—*
Richmond, Kenneth D.; Hartman, Russell E.; Rogers, Jerry W.; and Nelson, Jack, 4,096,764, Cl. 74-233.000.
Hartzell Propeller, Inc.: *See—*
Harlamert, W. Benjamin, 4,097,189, Cl. 416-46.000.
Harvell, Don L., to Singer Company, The. Quick lock-release mechanism for a trigger switch. 4,097,705, Cl. 200-157.000.
Harvey, John K., Jr.; Watson, Morris T.; Economy, Constantine F.; and LeFevre, Robert J., to American Can Company. System and apparatus for the reconstitution of a food or beverage concentrate. 4,096,893, Cl. 141-90.000.

Hasegawa, Osamu: *See*—
Murakami, Masuo; Takahashi, Kozo; Hirata, Yasufumi; Takashima, Mutsuo; Iwanami, Sumio; Hasegawa, Osamu; Nozaki, Yoshihisa; Tachikawa, Shiro; Takeda, Masaaki; and Usuda, Shinji, 4,097,487, Cl. 260-326.850.

Hasegawa, Yoshiyuki, to Toray Silicone Company, Ltd. Compositions comprising (1) a copolymer formed from an unsaturated acid and (2) an epoxy group-containing silane are useful textile and paper finishing materials. 4,097,643, Cl. 428-270.000.

Hassell, Dennis Ray. Cable operated log bunk. 4,097,058, Cl. 280-145.000.

Hathaway, Michael L., to PPG Industries, Inc. Ultraviolet light processor. 4,097,783, Cl. 315-323.000.

Hattes, Neil R.: *See*—
Eyrick, Theodore B.; Brown, Allen C.; and Hattes, Neil R., 4,096,858, Cl. 128-145.600.

Hause, Leroy Robert; and Coplin, Clarence William, to Boeing Company, The. Ultrasonic inspection apparatus. 4,096,755, Cl. 73-598.000.

Hauser, Oscar G.; Meagher, Thomas; and Ruckdeschel, Frederick R., to Xerox Corporation. Reproducing machine having interchangeable developer housings. 4,097,139, Cl. 355-4.000.

Hauser, Raimund: *See*—
Schild, Josef; Scheiber, Robert; Schmidt, Harald; Drasch, Josef; and Keznickl, Eduard, 4,097,906, Cl. 360-13.000.

Hauser Verwaltungs-Gesellschaft mit beschrankter Haftung: *See*—
Desor, Gerhard, 4,096,759, Cl. 73-731.000.

Haussmann, Albert: *See*—
Hennecke, Rudolf; and Haussmann, Albert, 4,096,916, Cl. 173-137.000.

Hawkins, Harold G., to General Motors Corporation. Insulation displacement terminal. 4,097,107, Cl. 339-97.00R.

Hawrylo, Frank Zygmunt; and Kressel, Henry, to RCA Corporation. Metallized device. 4,097,636, Cl. 428-209.000.

Hayashi, Hiroshi: *See*—
Ishida, Torao; Akiyama, Minoru; Nishimura, Daikichi; Hayashi, Hiroshi; Sakurai, Yoshio; and Tsukagoshi, Shigeru, 4,097,665, Cl. 536-23.000.

Hayashi, Shizuo: *See*—
Tsutsumi, Hisao; Hayashi, Shizuo; Nakayama, Hirokazu; and Ukena, Toshinao, 4,097,403, Cl. 252-312.000.

Hayashida, Motoyuki: *See*—
Satou, Haruhiko; Honiden, Yoshinori; Hayashida, Motoyuki; and Wakamoto, Mutsuo, 4,096,828, Cl. 123-209.000.

Hayashida, Susumu: *See*—
Fukumoto, Ichiro; and Hayashida, Susumu, 4,097,679, Cl. 13-32.000.

Hayes, John C., to UOP Inc. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 4,097,368, Cl. 208-139.000.

Hazlitt, William H. Fishing rod holding device. 4,097,017, Cl. 248-515.000.

Heberlein Maschinenfabrik AG: *See*—
Heyner, Harald, 4,096,611, Cl. 28-220.000.

Hebert, Roger T.: *See*—
Cosco, Robert J.; Lo, John M.; and Hebert, Roger T., 4,097,774, Cl. 313-178.000.

Hegge, Theodorus Cornelis Jozef Maria: *See*—
vanderVeen, Jan; and Hegge, Theodorus Cornelis Jozef Maria, 4,097,120, Cl. 350-350.000.

Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., to Gulf Oil Corporation. Thermosettable epoxide-polyanhydride compositions. 4,097,448, Cl. 260-42.180.

Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., to Gulf Oil Corporation. Handleable, thermosettable epoxide-polyanhydride compositions. 4,097,449, Cl. 260-42.180.

Heinen, Manfred, to Gutehoffnungshutte Sterkrade A.G. Gas-sealed contact-free shaft seal. 4,097,052, Cl. 277-96.200.

Heinlein, Hans: *See*—
Heinlein, Werner, 4,097,174, Cl. 407-46.000.

Heinlein, Werner, to Heinlein, Hans. Milling cutter. 4,097,174, Cl. 407-46.000.

Heinsohn, Howard H., Jr.: *See*—
Evers, William J.; Heinsohn, Howard H., Jr.; Shuster, Edward J.; and Schmitt, Frederick Louis, 4,097,396, Cl. 252-132.000.
Evers, William J.; and Heinsohn, Howard H., Jr., 4,097,532, Cl. 260-590.00D.
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,097,615, Cl. 426-535.000.

Heldmann, Heinrich: *See*—
Wallwey, Erich; Becker, Wolfgang; and Heldmann, Heinrich, 4,096,783, Cl. 89-34.000.

Helena Laboratories Corporation: *See*—
Golias, Tipton L.; and Mayes, David, 4,096,825, Cl. 118-221.000.

Helton, Eugene L.: *See*—
Kaarlela, Willard Oswald; and Helton, Eugene L., 4,096,653, Cl. 37-142.00A.

Hendon, Harry H.: *See*—
Neissel, John P.; Hendon, Harry H.; and Terhune, James H., 4,097,330, Cl. 176-19.00R.

Hendrickson, James B.: *See*—
Barcza, Sandor; and Hendrickson, James B., 4,097,609, Cl. 424-331.000.

Hendriks, Ferdinand: *See*—
Giordano, Francis Peter; and Hendriks, Ferdinand, 4,097,872, Cl. 346-75.000.

Hengstebeck, Robert J., to Standard Oil Company. System for steam-cracking hydrocarbons and transfer-line exchanger therefor. 4,097,544, Cl. 260-683.00R.

Henke, Arno, to BBC Brown, Boveri & Company, Limited. Clamping device for a thermally and electrically pressure-contacted semiconductor component in disk-cell construction. 4,097,036, Cl. 269-254.00R.

Hennecke, Rudolf; and Haussmann, Albert, to Delmag-Maschinenfabrik Reinhold Dornfeld. Diesel pile driver. 4,096,916, Cl. 173-137.000.

Henneveld, Clifford Hendrik: *See*—
Long, Terence Michael; and Henneveld, Clifford Hendrik, 4,096,867, Cl. 131-171.00R.

Her Majesty the Queen as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See*—
Feldman, Keiva, 4,097,803, Cl. 324-29.500.

Herberger, Roland: *See*—
Breuninger, Karl; Haberland, Detlef; and Herberger, Roland, 4,097,685, Cl. 174-68.500.

Herbst, LeRoy J.; and Jenkins, Thomas E., to General Electric Company. Heat shielding structure for dishwashers. 4,096,872, Cl. 134-105.000.

Hercules Incorporated: *See*—
Gardner, William H.; Graham, Donald H.; and Williams, George M., 4,097,115, Cl. 149-2.000.
Jabloner, Harold, 4,097,460, Cl. 260-47.0UA.

Hermann Stock, Firma: *See*—
Stock, Hermann, 4,097,235, Cl. 21-93.000.

Hernandez, Henry R.: *See*—
Pastor, Stephen D.; Skoultchi, Martin M.; and Hernandez, Henry R., 4,097,350, Cl. 204-159.230.
Pastor, Stephen D.; Skoultchi, Martin M.; and Hernandez, Henry R., 4,097,417, Cl. 252-501.000.

Herold, Albert: *See*—
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan Martinov; Pascault, Jean-Pierre; Pham, Quang Tho; Pillot, Christian; and Salle, Robert, 4,097,660, Cl. 526-173.000.

Herron, Allen R. Internal combustion assisted hydraulic engine. 4,097,198, Cl. 417-245.000.

Hewlett-Packard Company: *See*—
Joly, Robert, 4,097,822, Cl. 331-101.000.
Morris, Raymond A.; and Viola, Thomas J., Jr., 4,097,890, Cl. 357-55.000.

Heymes, Rene, to Roussel Uclaf. 7-Amino-thiazolyl acetamido cephalosporanic acids. 4,097,595, Cl. 424-246.000.

Heyn, Bennington. Powered shopping cart and trailer. 4,096,920, Cl. 180-11.000.

Heyner, Harald, to Heberlein Maschinenfabrik AG. Apparatus for moistening and texturing yarns. 4,096,611, Cl. 28-220.000.

Hibert, Maurice. Wall member. 4,096,676, Cl. 52-220.000.

Hicks, Leon E.: *See*—
Habiger, Cyril W.; and Hicks, Leon E., 4,096,694, Cl. 60-459.000.

Hicksted, Richard L.: *See*—
Bertin, Michael C.; Hicksted, Richard L.; and Mitsuhashi, James M., 4,097,566, Cl. 264-40.700.

Hidaka, Mikio: *See*—
Umemura, Sumio; Ohdan, Kyoji; Uda, Taizo; Matsuzaki, Tokuo; Hidaka, Mikio; Nakamura, Yasuo; and Tsuruoka, Masao, 4,097,518, Cl. 260-465.300.

Higuchi, Kousaku; Sato, Satoshi; and Wada, Susumu, to Kawasaki Jukogyo Kabushiki Kaisha; and Nippon Kokan Kabushiki Kaisha. Lance supporting and gyrating device in a steel-refining converter. 4,097,031, Cl. 266-226.000.

Hijikata, Akiko: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,097,472, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,097,591, Cl. 424-177.000.

Hild, Werner: *See*—
Guber, Walter; Saidl, Jaroslav; Daruschy, Paul; and Hild, Werner, 4,097,401, Cl. 252-301.10W.

Hildebrandt, Juergen J.: *See*—
Cramer, Rudolf; and Hildebrandt, Juergen J., 4,096,857, Cl. 128-84.00R.

Hilgeman, Theodore W.: *See*—
Egan, Walter G.; Hallock, Herbert B.; and Hilgeman, Theodore W., 4,097,751, Cl. 250-571.000.

Hill, Eugene F., to Varian Associates, Inc. High vacuum pump. 4,097,195, Cl. 417-49.000.

Hill, Paul David: *See*—
Mitchell, Allen L., 4,096,847, Cl. 126-61.000.

Hill, Roland John; Price, Robert Bryn; and Jewell, Norman Thomas, to Rolls-Royce Limited. Lasers. 4,097,820, Cl. 331-94.50G.

Hilton, Joseph James; and Malloy, James Joseph, Jr., to International Telephone & Telegraph Corporation. Xenon arc discharge lamp having a particular electrode composition and wherein the arc discharge is obtained without heating the electrode. 4,097,762, Cl. 313-218.000.

Hindermayr, Martin; and Wagner, Ferdinand, to Wilhelm Ruf KG. Tuning unit with bandswitch for high frequency receivers. 4,097,828, Cl. 334-7.000.

Hirasawa, Hiroshi: *See*—
Horikiri, Kazuhito; Hirasawa, Hiroshi; and Fujiwara, Minoru, 4,096,769, Cl. 74-801.000.

Hirata, Yasufumi: *See*—
Murakami, Masuo; Takahashi, Kozo; Hirata, Yasufumi; Takashima, Mutsuo; Iwanami, Sumio; Hasegawa, Osamu; Nozaki, Yoshihisa; Tachikawa, Shiro; Takeda, Masaaki; and Usuda, Shinji, 4,097,487, Cl. 260-326.850.
Hiratsuka, Nobuo: *See*—
Ohtani, Sumio; Hiratsuka, Nobuo; and Horiguchi, Masaru, 4,097,383, Cl. 210-500.00M.
Hirota, Jun: *See*—
Komatsu, Koei; Itoyama, Kenji; Hirota, Jun; and Nishijima, Akio, 4,097,661, Cl. 526-175.000.
Hirsch, Richard H., to Monsanto Company. Process for polymerizing 4,4'-thiobis(6-tert-butyl-m-cresol). 4,097,534, Cl. 260-609.00F.
Hirsch, Wolfgang, to Riedel-de Haen Aktiengesellschaft. Process for the production of a diagnostic agent for the detection of ketones. 4,097,240, Cl. 23-253.0TP.
Histand, Ivan Gerald: *See*—
Ahmed, Nazeer; and Histand, Ivan Gerald, 4,096,721, Cl. 72-60.000.
Hitachi, Ltd.: *See*—
Ishizuka, Kohei; Kita, Yasuhiro; Takasaki, Yoshitaka; and Nakagawa, Junichi, 4,097,824, Cl. 333-28.00R.
Koizumi, Hideaki; Arai, Yoji; and Murayama, Seiichi, 4,097,781, Cl. 315-176.000.
Miyakawa, Nobuaki, 4,097,857, Cl. 340-324.00R.
Namikas, Daumantas; and Kuwabara, Takao, 4,097,183, Cl. 415-1.000.
Hobart Corporation: *See*—
Fields, Virgil L., 4,097,098, Cl. 312-311.000.
Geiger, Paul B., 4,097,307, Cl. 134-10.000.
Treiber, Fritz F.; and Graham, Francis E., 4,096,968, Cl. 220-314.000.
Hocker, Eitel: *See*—
Diels, Manfred; Dienstuhl, Karl Wilhelm; Jager, Tilo; and Hocker, Eitel, 4,096,678, Cl. 52-403.000.
Hodgson, John: *See*—
Cooke, William Ernest; Hodgson, John; and Sasaki, Mitsuo, 4,097,342, Cl. 204-28.000.
Hoechst Aktiengesellschaft: *See*—
Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 4,097,496, Cl. 260-345.80P.
Dany, Franz-Josef; Mietens, Gerhard; and Schallus, Erich, 4,097,656, Cl. 526-1.000.
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Schroder, Martin, 4,097,623, Cl. 427-230.000.
Holst, Arno; and Kostrzewa, Michael, 4,097,667, Cl. 536-87.000.
Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, 4,097,452, Cl. 260-45.80N.
Niermann, Hermann; and Mainzer, Franz, 4,097,583, Cl. 423-303.000.
Papenfuhs, Theodor; and Troster, Helmut, 4,097,450, Cl. 260-42.210.
Papenfuhs, Theodor; and Volk, Heinrich, 4,097,510, Cl. 260-439.00R.
Rohrscheid, Freimund, 4,097,492, Cl. 260-345.200.
Schmidbaur, Hubert; and Gasser, Oswald, 4,097,509, Cl. 260-430.000.
Teige, Wolfgang; and Schickfluss, Rudolf, 4,097,444, Cl. 260-40.00P.
Weigand, Hanfried, 4,096,853, Cl. 128-2.00A.
Wortmann, Joachim; Dany, Franz-Josef; and Kandler, Joachim, 4,097,400, Cl. 252-182.000.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. O-[1-substituted-6-pyridazinon(3)yl]-thionoalkanephosphonic acid esters for combating insects and acarids. 4,097,592, Cl. 424-200.000.
Hoffmann-La Roche Inc.: *See*—
Berger, Leo; and Schmidt, Robert August, 4,097,497, Cl. 260-346.710.
Chan, Ka-Kong; and Saucy, Gabriel, 4,097,495, Cl. 260-345.500.
Hofmann, Hans Joachim; and Jankewitz, Axel, to Schwan-Bleistift-Fabrik Schwanhausser & Company. Ink with ester additive providing easy wipe off of ink markings. 4,097,289, Cl. 106-26.000.
Hofmann, Karl: *See*—
Eckert, Konrad; Hofmann, Karl; and Seifert, Kurt, 4,096,999, Cl. 239-533.500.
Hogendobler, Richard Shure: *See*—
Forney, Edgar Wilmot, Jr.; and Hogendobler, Richard Shure, 4,096,627, Cl. 29-628.000.
Holan, George: *See*—
Evans, John James Alexander; and Holan, George, 4,097,599, Cl. 424-263.000.
Hollandse Signaalapparaten B.V.: *See*—
Brands, Antoon Hendrikus; Gietema, Jouke; and Bleijerveld, Hendrik Cornelis, 4,097,848, Cl. 365-118.000.
Holmes, Charles F. System for reducing the number of cylinders used in a multi-cylinder engine. 4,096,845, Cl. 123-198.00F.
Holowaty, Michael O., to Inland Steel Company. Method for producing carbonaceous material. 4,097,245, Cl. 44-23.000.
Holst, Arno; and Kostrzewa, Michael, to Hoechst Aktiengesellschaft. Hydroxyalkyl cellulose ethers. 4,097,667, Cl. 536-87.000.
Holt, Richard C.; Damon, Neil F.; and Hanlon, Richard J., to Augat Inc. Electrical interconnection boards with lead sockets mounted therein and method for making same. 4,097,101, Cl. 339-17.00C.
Holub, Fred F.: *See*—
Abolins, Visvaldis; and Holub, Fred F., 4,097,446, Cl. 260-40.00R.
Holzgruber, Wolfgang, to INTECO Internationale Technische Beratung Gesellschaft m.b.H. Process of desulfurizing liquid melts. 4,097,269, Cl. 75-58.000.
Homeyer, Bernhard: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,097,592, Cl. 424-200.000.
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Homeyer, Bernhard, 4,097,593, Cl. 424-200.000.
Reisdorff, Josef Helmut; Brandes, Wilhelm; Scheinpflug, Hans; Homeyer, Bernhard; and Roessler, Peter, 4,097,669, Cl. 542-413.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Iiyama, Masahiko; and Ishii, Makoto, 4,096,837, Cl. 123-119.00F.
Kurata, Noboru, 4,096,842, Cl. 123-179.00S.
Okada, Motohiro; Oka, Katsumi; Honda, Kiyoshi; and Matsuura, Kazuo, 4,097,065, Cl. 280-739.000.
Honda, Kiyoshi: *See*—
Okada, Motohiro; Oka, Katsumi; Honda, Kiyoshi; and Matsuura, Kazuo, 4,097,065, Cl. 280-739.000.
Honick, Cecil W. Pole pruner. 4,096,630, Cl. 30-258.000.
Honiden, Yoshinori: *See*—
Satou, Haruhiko; Honiden, Yoshinori; Hayashida, Motoyuki; and Wakamoto, Mutsuo, 4,096,828, Cl. 123-209.000.
Hoover, Michael C.; and Long, William C., to Geosource Inc. Apparatus for performing a three-way sort. 4,096,949, Cl. 209-74.00M.
Hora, Charles J.: *See*—
Sieglaff, Charles L.; Hora, Charles J.; and Tiefenbach, Joseph P., 4,097,657, Cl. 526-30.000.
Hori, Kenji: *See*—
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,096,692, Cl. 60-307.000.
Horibe, Kinya: *See*—
Ishibashi, Toshihiro; Horibe, Kinya; Ishida, Masaharu; and Sano, Youzi, 4,097,311, Cl. 148-6.210.
Horiguchi, Masaru: *See*—
Ohtani, Sumio; Hiratsuka, Nobuo; and Horiguchi, Masaru, 4,097,383, Cl. 210-500.00M.
Horikawa, Susumu; Nakagawa, Kenji; and Nogami, Yoshito, to Hoya Glass Works, Ltd. Optical fiber. 4,097,258, Cl. 65-31.000.
Horikiri, Kazuhito; Hirasawa, Hiroshi; and Fujiwara, Minoru, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Planetary gear type transmission. 4,096,769, Cl. 74-801.000.
Horne, William E., to Boeing Company, The. Thermally isolated solar cell construction. 4,097,309, Cl. 136-89.0PC.
Horowitz, Charles, to Sloan Valve Company. Relay valve. 4,096,884, Cl. 137-627.500.
Horrom, Bruce Wayne; Minard, Frederick Nelson; and Zaugg, Harold Elmer, to Abbott Laboratories. Dibenzo[b,e][1,4]diazepines. 4,097,597, Cl. 424-250.000.
Horstmann, Winfried, to Robert Bosch GmbH. Method and apparatus for the suppression of switching disturbances. 4,097,907, Cl. 360-33.000.
Horvath, Erich. Cemented carbide metal alloy containing auxiliary metal, and process for its manufacture. 4,097,275, Cl. 75-203.000.
Hosaka, Akihiko: *See*—
Tokuoka, Yasumichi; Fukuda, Kazumasa; and Hosaka, Akihiko, 4,097,313, Cl. 148-105.000.
Hoshikawa, Masao: *See*—
Kumamaru, Hiroyuki; Shioyama, Hiromu; and Hoshikawa, Masao, 4,097,119, Cl. 350-96.230.
Hosko, Robert M., to Banner Metals Division of Intercole automation, Inc. Bulk mail container. 4,097,097, Cl. 312-250.000.
Hosokawa, Yasuhiro: *See*—
Miki, Tosaku; Hosokawa, Yasuhiro; Miwa, Tamotsu; Fujita, Hiroshi; Asano, Masahide; and Aibara, Shunzo, 4,097,608, Cl. 424-324.000.
Hotz, Roger D.; Stach, Leonard J.; and Richter, Sidney B., to Velsicol Chemical Corporation. N-Dialkoxyalkyl-N-dioxanalkylene-α-haloalkanamides. 4,097,491, Cl. 260-340.700.
Houdaille Industries, Inc.: *See*—
Kaufmann, Harold, 4,096,774, Cl. 83-552.000.
Houser, John Martin, to Singer Company, The. Trigger switch and lock mechanism therefore. 4,097,703, Cl. 200-157.000.
Howard, Edward George, Jr., to Du Pont de Nemours, E. I., and Company. High tensile strength polyethylene/low-hydration alumina composites. 4,097,447, Cl. 260-42.140.
Howard, John R.; and Loomis, Robert W., to Next Generation Housing Corporation of America. Split-slab house construction. 4,096,675, Cl. 52-79.100.
Hoy, Malcolm G.: *See*—
Reichelt, Walter R., Jr.; and Hoy, Malcolm G., 4,097,716, Cl. 219-137.00R.
Hoya Glass Works, Ltd.: *See*—
Horikawa, Susumu; Nakagawa, Kenji; and Nogami, Yoshito, 4,097,258, Cl. 65-31.000.
Hsu, John Shao-Tze, to Ingersoll-Rand Company. Parison extrusion head. 4,097,214, Cl. 425-466.000.
Hu, Kuo-Kuang: *See*—
Kirmser, Philip George; and Hu, Kuo-Kuang, 4,096,934, Cl. 400-110.000.
Huang, Tracy J.: *See*—
Haag, Werner O.; and Huang, Tracy J., 4,097,367, Cl. 208-135.000.
Hubbard, Elbert M.: *See*—
Melton, Rosser B., Jr.; and Hubbard, Elbert M., 4,096,945, Cl. 206-469.000.

Hudson, M. Louise. Bus chair pillow sleeping device. 4,097,086, Cl. 297-217.000.
Huggins, Dale K.: *See—*
Chou, Eddie C. J.; Barlow, Craig B.; and Huggins, Dale K., 4,097,575, Cl. 423-150.000.
Hughes Aircraft Company: *See—*
Fry, Stephen M., 4,097,148, Cl. 356-5.000.
Gerard, Henry M., 4,097,825, Cl. 333-30.00R.
Moyer, Norman E., 4,097,844, Cl. 340-146.200.
Hullinger, Lee, Jr.; and Noble, Leo E., to General Motors Corporation. Radio with automatic scan tuning. 4,097,811, Cl. 325-470.000.
Humes, Norman S.: *See—*
Uhtenwoldt, Herbert R.; Humes, Norman S.; and Crossman, Richard E., 4,096,667, Cl. 51-99.000.
Hunt Valve Co., Inc.: *See—*
Lemmon, John C.; Olson, Donald R.; and Zepernick, Dean E., 4,096,880, Cl. 137-454.200.
Huntzinger, Gerald O.; Buck, Charles E.; and Campbell, Robert E., to General Motors Corporation. Engine detonation sensor with double shielded case. 4,096,735, Cl. 73-35.000.
Huseby, Irvin C.; and Klug, Frederic J., to General Electric Company. Core and mold materials for directional solidification of advanced superalloy materials. 4,097,291, Cl. 106-38.900.
Huseby, Irvin C.; and Klug, Frederic J., to General Electric Company. Core and mold materials and directional solidification of advanced superalloy materials. 4,097,292, Cl. 106-38.900.
Huskins, Chester W., to United States of America, Army. Co-polymers of butadiene and carboranyl methacrylate. 4,097,662, Cl. 526-217.000.
Husson, Alan L.: *See—*
Koob, Robert W.; and Husson, Alan L., 4,096,925, Cl. 187-29.00R.
Hutchinson, Florence M., executrix: *See—*
Hutchinson, William Milton, deceased; and Hutchinson, Florence M., executrix, 4,097,398, Cl. 252-162.000.
Hutchinson, William Milton, deceased; and by Hutchinson, Florence M., executrix, to Phillips Petroleum Company. Constant boiling admixtures. 4,097,398, Cl. 252-162.000.
I-T-E Imperial Corporation: *See—*
Rys, Tadeusz J., 4,097,830, Cl. 335-21.000.
I-T-E Industries Ltd.: *See—*
Spencer, Edward M., 4,097,681, Cl. 174-12.00R.
Iberastron, S.L.: *See—*
Astarloa, Jose Manuel Alonso, 4,097,136, Cl. 353-71.000.
ICI Americas Inc.: *See—*
Rutledge, Thomas F., 4,097,461, Cl. 260-47.0ET.
Iguchi, Masayuki, to Glory Kogyo Kabushiki Kaisha. Note discriminating apparatus. 4,096,991, Cl. 235-419.000.
Ihara Chemical Kogyo Kabushiki Kaisha: *See—*
Koike, Wataro; Takayama, Masami; Ohashi, Hideaki; and Matsui, Sadayoshi, 4,097,426, Cl. 260-2.5AM.
IIT Research Institute: *See—*
Camras, Marvin, 4,097,893, Cl. 358-83.000.
Iiyama, Masahiko; and Ishii, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Automatic choking device of electric heating type. 4,096,837, Cl. 123-119.00F.
Ikawa, Kazuo; and Matsuoka, Hideoki, to Nissan Motor Company, Limited. Air-cushion device with a cover and a cover cutter. 4,097,064, Cl. 280-732.000.
Ikeda, Akira: *See—*
Akaba, Hayao; Ikeda, Akira; and Lee, Masayoshi, 4,096,684, Cl. 51-101.0LG.
Ikemoto, Masanori: *See—*
Shirasaka, Kaname; Nakagami, Yoshihiro; Tomiyori, Takashi; Ikemoto, Masanori; and Shaura, Tsuneo, 4,097,621, Cl. 427-173.000.
Imamura, Shigeyasu: *See—*
Tsuto, Keiichi; Majima, Kanji; and Imamura, Shigeyasu, 4,097,242, Cl. 23-283.000.
Imamura, Takeo: *See—*
Toyama, Kunio; Shimizu, Isamu; Imamura, Takeo; and Nakanishi, Atsuo, 4,097,556, Cl. 260-886.000.
Imazeki, Kazuyoshi; and Kazami, Koichi, to General Research of Electronics, Inc. Tuning system. 4,097,816, Cl. 331-2.000.
Immel, Otto; Schwarz, Hans-Helmut; and Weissel, Oskar, to Bayer Aktiengesellschaft. Process for the preparation of 2-alkyl-2-methylpropane-1,3-diol. 4,097,540, Cl. 568-862.000.
Imperial Chemical Industries Limited: *See—*
Den Boer, Cornelis, 4,096,701, Cl. 61-38.000.
Lake, Ivan James Samuel, 4,097,542, Cl. 260-671.00M.
Imperial Group Limited: *See—*
Long, Terence Michael; and Henneveld, Clifford Hendrik, 4,096,867, Cl. 131-171.00R.
Ina, Osamu: *See—*
Yamawaki, Masao; Aoki, Katsuo; Oka, Yoshio; Suzuki, Takao; Ina, Osamu; and Hara, Kunihiko, 4,096,822, Cl. 118-48.000.
Indesit Industria Elettrodomestici Italiana S.p.A.: *See—*
Campioni, Armando, 4,097,815, Cl. 330-289.000.
Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See—*
Schaffler, Georg, 4,096,959, Cl. 214-302.000.
Inertia Switch Limited: *See—*
Jackman, Peter Ronald, 4,097,698, Cl. 200-61.45R.
Ing. C. Olivetti & C., S.p.A.: *See—*
Figini, Mario, 4,097,924, Cl. 364-900.000.
Ingerman, Carol M.: *See—*
Silver, Melvin J.; Smith, John Bryan; and Ingerman, Carol M., 4,097,602, Cl. 424-305.000.
Ingersoll-Rand Company: *See—*
Banerjee, Bani Ranjan, 4,097,711, Cl. 219-76.150.
Hsu, John Shao-Tze, 4,097,214, Cl. 425-466.000.
Ingham, William Ellis; and Williams, Anthony Michael, to EMI Limited. Driving and positioning arrangement for radiography. 4,097,746, Cl. 250-444.000.
Inland Steel Company: *See—*
Holowaty, Michael O., 4,097,245, Cl. 44-23.000.
Inoue, Hiroshi: *See—*
Komeya, Katsutoshi; and Inoue, Hiroshi, 4,097,293, Cl. 106-43.000.
Institute of Paper Chemistry, The: *See—*
Johnson, Donald C.; and Nicholson, Myron D., 4,097,666, Cl. 536-57.000.
INTECO Internationale Technische Beratung Gesellschaft m.b.H.: *See—*
Holzgruber, Wolfgang, 4,097,269, Cl. 75-58.000.
International Biomedical Laboratories, Inc.: *See—*
Serur, Juan Ricardo; and Loeffler, Herbert Heinz, 4,096,879, Cl. 137-391.000.
International Business Machines Corporation: *See—*
Cook, Peter William; Parrish, James Thomas; and Schuster, Stanley Everett, 4,097,753, Cl. 307-359.000.
Garwin, Richard Lawrence; and Levine, James Lewis, 4,097,115, Cl. 350-6.700.
Giordano, Francis Peter; and Hendriks, Ferdinand, 4,097,872, Cl. 346-75.000.
King, Francis Kong; and Schmidt, Jon Jay, 4,097,909, Cl. 360-99.000.
Lamoureux, William Roger; and Trushell, James Bryce, 4,097,856, Cl. 340-324.00M.
Martin, Van Clifton, 4,097,873, Cl. 346-75.000.
Mazzeo, Nickolas Joseph; and Thompson, David A., 4,097,802, Cl. 324-252.000.
Olsen, Carlton Edward; and Serpa, Leroy Jasper, 4,096,626, Cl. 29-624.000.
Zappe, Hans Helmut, 4,097,765, Cl. 307-212.000.
International Flavors & Fragrances, Inc.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Shuster, Edward J.; and Schmitt, Frederick Louis, 4,097,396, Cl. 252-132.000.
Evers, William J.; and Heinsohn, Howard H., Jr., 4,097,532, Cl. 260-590.00D.
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,097,615, Cl. 426-535.000.
Hall, John B.; Sprecker, Mark A.; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; and Novak, Robert M., 4,097,416, Cl. 252-522.000.
International Nickel Company, Inc., The: *See—*
Sandrock, Gary Dale, 4,096,639, Cl. 34-15.000.
Sandrock, Gary Dale, 4,096,641, Cl. 34-15.000.
International Standard Electric Corporation: *See—*
Selway, Peter Richard; Chown, Martin; Epworth, Richard Edward; Leggett, Norman Derek; and Sunak, Harish Ram Dass, 4,097,891, Cl. 357-81.000.
International Telephone & Telegraph Corporation: *See—*
Cook, Charles R., Jr., 4,096,619, Cl. 29-413.000.
Eberhardt, Edward Herbert, 4,097,742, Cl. 250-333.000.
Guevara, Humberto F.; and Geimer, Michael R., 4,096,892, Cl. 140-140.000.
Hilton, Joseph James; and Malloy, James Joseph, Jr., 4,097,762, Cl. 313-218.000.
Interox Chemicals Limited: *See—*
Cubbon, Robert Charles Patrick; Russell, Peter John; Talbot, Robert Eric; and Woodbridge, David Thomas, 4,097,536, Cl. 260-610.00R.
Intertherm, Inc.: *See—*
DelPercio, Michael J.; and Krejci, Wayne E., 4,097,721, Cl. 219-366.000.
Irikura, Tsutomu, to Kyorin Pharmaceutical Co., Ltd. Pyrazolo[1,5-a]pyridines. 4,097,483, Cl. 260-296.00H.
Isda Fabrikker A/S: *See—*
Evensen, Harald Thiis; and Tellesbo, Ola, 4,097,644, Cl. 428-281.000.
Ishibashi, Toshihiro; Horibe, Kinya; Ishida, Masaharu; and Sano, Youzi, to Yazaki Sogyo Kabushiki Kaisha. Absorption surface of solar collector. 4,097,311, Cl. 148-6.210.
Ishida, Masaharu: *See—*
Ishibashi, Toshihiro; Horibe, Kinya; Ishida, Masaharu; and Sano, Youzi, 4,097,311, Cl. 148-6.210.
Ishida, Torao; Akiyama, Minoru; Nishimura, Daikichi; Hayashi, Hiroshi; Sakurai, Yoshio; and Tsukagoshi, Shigeru, to Asahi Kasei Kogyo Kabushiki Kaisha. Diacylnucleosides and process for preparing the same. 4,097,665, Cl. 536-23.000.
Ishigami, Noriakira: *See—*
Otsuka, Katsumi; Ishigami, Noriakira; and Kozakai, Asao, 4,097,841, Cl. 340-52.00C.
Ishii, Makoto: *See—*
Iiyama, Masahiko; and Ishii, Makoto, 4,096,837, Cl. 123-119.00F.
Ishii, Ryoichi; Sakurai, Yoshishige; Yamada, Hiroshi; Uchida, Kuniharu; and Suzuki, Kanekichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for examining weld defects in vertical pipes by supersonic waves. 4,096,757, Cl. 73-621.000.
Ishikawa, Shozo: *See—*
Kitahara, Makoto; Ishikawa, Shozo; Katagiri, Kazuharu; Arita, Tetsuo; and Masubuchi, Shoji, 4,097,646, Cl. 428-323.000.
Ishizuka, Hiroshi. Ultrahigh pressure apparatus for diamond synthesis. 4,097,208, Cl. 425-77.000.

Ishizuka, Kohei; Kita, Yasuhiro; Takasaki, Yoshitaka; and Nakagawa, Junichi, to Hitachi, Ltd. Variable equalizer. 4,097,824, Cl. 333-28.00R.

Isothermics, Inc.: *See*—
Rhodes, Robin B.; and Vobecky, Paul, 4,096,723, Cl. 72-123.000.

Ito, Hitoshi; and Kogure, Hideo, to Kansai Paint Co., Ltd. Inorganic film forming composition for coating. 4,097,287, Cl. 106-14.140.

Ito, Keiko: *See*—
Asano, Takateru; and Ito, Keiko, 4,097,283, Cl. 96-115.00R.

Ito, Wataru: *See*—
Tamura, Takaaki; Fujita, Norihiko; Matsuura, Chihiro; Ito, Wataru; and Negishi, Naoki, 4,097,576, Cl. 423-239.00A.

Itoyama, Kenji: *See*—
Komatsu, Koei; Itoyama, Kenji; Hirota, Jun; and Nishijima, Akio, 4,097,661, Cl. 526-175.000.

ITT Industries, Incorporated: *See*—
Gollinger, Wolfgang, 4,097,771, Cl. 307-268.000.

Ivanov, Assen Ninov: *See*—
Sendov, Stoyan Hristov; Kuklin, Ivan Alexandrov; Nikolov, Ivan Angelov; Ivanov, Assen Ninov; Mirchev, Mircho Georgiev; and Kurtashev, Radoslav Borissov, 4,097,927, Cl. 366-247.000.

Iversen, Poul Christian Carlos: *See*—
Olsen, Gunnar Ernst Rudolf; Iversen, Poul Christian Carlos; and Birker, Bertel, 4,097,719, Cl. 219-364.000.

Iverson, Lowell P.; Dirscherl, George W.; and Hagen, Paul D., to Caterpillar Tractor Co. Pivot pin assembly. 4,096,957, Cl. 214-145.00R.

Iwamatsu, Junkichi: *See*—
Nagao, Shozo; Iwamatsu, Junkichi; Kitsukawa, Hiroshi; Nishizaki, Kozo; Watanabe, Yuichi; and Okamoto, Yasunori, 4,097,074, Cl. 285-231.000.

Iwamoto, Kuniharu: *See*—
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Iwanami, Sumio: *See*—
Murakami, Masuo; Takahashi, Kozo; Hirata, Yasufumi; Takashima, Mutsuo; Iwanami, Sumio; Hasegawa, Osamu; Nozaki, Yoshihisa; Tachikawa, Shiro; Takeda, Masaaki; and Usuda, Shinji, 4,097,487, Cl. 260-326.850.

Izon Corporation: *See*—
Yevick, George J., 4,097,137, Cl. 353-120.000.

J. P. Schmidt Jun. A/S: *See*—
Thomsen, Jorgen Thyrsted, 4,096,775, Cl. 83-511.000.

Jabloner, Harold, to Hercules Incorporated. Poly(arylacetylenes) and thermoset resins therefrom. 4,097,460, Cl. 260-47.0UA.

Jackman, Peter Ronald, to Inertia Switch Limited. Seismonastic switches with inertia responsive controller. 4,097,698, Cl. 200-61.45R.

Jackson, Amos R.: *See*—
Casull, Don C.; Dalton, James M.; Jackson, Calvin W.; and Jackson, Amos R., 4,096,832, Cl. 123-32.0SP.

Jackson, Calvin W.: *See*—
Casull, Don C.; Dalton, James M.; Jackson, Calvin W.; and Jackson, Amos R., 4,096,832, Cl. 123-32.0SP.

Jackson, Stephen F.: *See*—
Forsen, George E.; and Jackson, Stephen F., 4,097,847, Cl. 340-146.3AE.

Jacobs Manufacturing Company, Limited, The: *See*—
Derbyshire, George Cecil, 4,097,054, Cl. 279-64.000.

Jacobson, Arnold Frederick; and Pazaris, James Oliver, to Radnovation, Incorporated. Radiation energy calibrating device and method. 4,097,736, Cl. 250-252.000.

Jacquelin, Jean, to Compagnie Generale d'Electricite S.A. Method and device for regenerating zinc. 4,097,357, Cl. 204-252.000.

Jacques, Donald F.: *See*—
Schell, Charles E.; Deegan, Dennis C.; and Jacques, Donald F., 4,097,341, Cl. 204-1.00T.

Jaeger, C. Rene: *See*—
Blackmer, David E.; and Jaeger, C. Rene, 4,097,767, Cl. 307-229.000.

Jager, Tilo: *See*—
Diels, Manfred; Dienstuhl, Karl Wilhelm; Jager, Tilo; and Hocker, Eitel, 4,096,678, Cl. 52-403.000.

James, Daniel Shaw, to Du Pont de Nemours, E. I., and Company. Disperse mono- and bisazo dyes derived from 2-amino-4,5-dicyanoimidazole. 4,097,475, Cl. 260-157.000.

James, Leonard Evans; Balint, Laszlo Joseph; and Lazarus, Stanley David, to Allied Chemical Corporation. Process for preparing polyesters. 4,097,468, Cl. 260-75.00M.

James, Stanley E.: *See*—
Crawford, Daniel G.; James, Stanley E.; and Nixon, Donald H., 4,097,071, Cl. 285-94.000.

Jankewitz, Axel: *See*—
Hofmann, Hans Joachim; and Jankewitz, Axel, 4,097,289, Cl. 106-26.000.

Jankovsky, William O.: *See*—
Carlson, George A.; and Jankovsky, William O., 4,096,711, Cl. 64-13.000.

Janome Sewing Machine Co. Ltd.: *See*—
Niikura, Masakatsu, 4,096,813, Cl. 112-275.000.

Jansa, Wolfgang: *See*—
Beggs, James Ingram; Langlitz, Karlheinz; Schmitz, Gunter; and Jansa, Wolfgang, 4,096,918, Cl. 177-145.000.

Jansen, Alan A. Headrest. 4,097,038, Cl. 269-328.000.

Janssen, Peter Silvester Lambertus: *See*—
Konttinen, Aarne Ilmari; Goverde, Bastiaan Cornelis; and Janssen, Peter Silvester Lambertus, 4,097,338, Cl. 195-103.50R.

Japan Steel Works, Ltd., The: *See*—
Morishima, Yukimas; Yoshida, Minoru; and Masuda, Hideo, 4,097,212, Cl. 425-313.000.

Japan Synthetic Rubber Co., Ltd.: *See*—
Komatsu, Koei; Itoyama, Kenji; Hirota, Jun; and Nishijima, Akio, 4,097,661, Cl. 526-175.000.

Jayne, Gerald John Joseph: *See*—
Askew, Herbert Frank; Jayne, Gerald John Joseph; and Elliott, John Scotchford, 4,097,474, Cl. 260-139.000.

Jeffery, Edwin A.: *See*—
Seligman, Lawrence; Ballard, James P.; and Jeffery, Edwin A., 4,097,729, Cl. 235-467.000.

Jencks, Charles L.; and Castonguay, Roger N., to General Electric Company. Circuit breaker accessory tripping apparatus. 4,097,831, Cl. 335-166.000.

Jenik, Franz, to Siemens Aktiengesellschaft. Rectifier. 4,097,768, Cl. 307-230.000.

Jenkins, Kenneth W., to General Electric Company. Coaxial disk stack acyclic machine. 4,097,758, Cl. 310-178.000.

Jenkins, Thomas E.: *See*—
Herbst, LeRoy J.; and Jenkins, Thomas E., 4,096,872, Cl. 134-105.000.

Jensen, Hilmer: *See*—
Brauer, Harald Otto Christian; Jensen, Knud Sejr; Andreasen, Torben; Jensen, Hilmer; Greve, Mogens; and Kurstein, Peter, 4,097,320, Cl. 156-109.000.

Jensen, Knud Sejr: *See*—
Brauer, Harald Otto Christian; Jensen, Knud Sejr; Andreasen, Torben; Jensen, Hilmer; Greve, Mogens; and Kurstein, Peter, 4,097,320, Cl. 156-109.000.

Jerie, Hans G. Projection device. 4,097,134, Cl. 353-11.000.

Jerinic, George; Thoren, Glenn R.; Sullivan, Francis J., Jr.; and Lampen, James L., to Raytheon Company. Transmitter wherein outputs of a plurality of pulse modulated diode oscillators are combined. 4,097,823, Cl. 332-9.00R.

Jerinic, George: *See*—
Lampen, James L.; Jerinic, George; and Thoren, Glenn R., 4,097,821, Cl. 331-101.000.
Thoren, Glenn R.; Lampen, James L.; and Jerinic, George, 4,097,817, Cl. 331-56.000.

Jewell, Norman Thomas: *See*—
Hill, Roland John; Price, Robert Bryn; and Jewell, Norman Thomas, 4,097,820, Cl. 331-94.50G.

Joanna Western Mills Company: *See*—
Donofrio, John D., 4,096,904, Cl. 160-299.000.

Johns Hopkins University, The: *See*—
Fischell, Robert E., 4,096,866, Cl. 128-419.0PG.

Johnson, Donald C.; and Nicholson, Myron D., to Institute of Paper Chemistry, The. Solvent system for polysaccharides. 4,097,666, Cl. 536-57.000.

Johnson, Walter E., Jr.: *See*—
Bledsoe, James O., Jr.; and Johnson, Walter E., Jr., 4,097,531, Cl. 260-586.00R.

Johnston, Thomas Frazier, Jr.: *See*—
Manoukian, Nubar Sahag; and Johnston, Thomas Frazier, Jr., 4,097,818, Cl. 331-94.50C.

Joly, Robert, to Hewlett-Packard Company. Broad-band cavity-tuned transistor oscillator. 4,097,822, Cl. 331-101.000.

Jones, Gerald N., to United States of America, Navy. Electronic countermeasure sequence timer. 4,097,865, Cl. 343-18.00E.

Jones, Howell A., Jr.: *See*—
Eckert, Alton B., Jr.; Jones, Howell A., Jr.; and Check, Frank T., Jr., 4,097,923, Cl. 364-900.000.

Jones, Norman Stewart; and Bennett, Geoffrey Richard, to Pneupac Limited. Pressure fluid-actuated oscillator. 4,096,875, Cl. 137-102.000.

Jones & Vining, Incorporated: *See*—
Cohen, Arnold, 4,096,733, Cl. 73-7.000.

Jordan, Richard J. Pulse ignition distributor. 4,096,840, Cl. 123-146.50A.

Josef Martin Feuerungsbau GmbH: *See*—
Martin, Johannes Josef; and Weber, Erich, 4,096,809, Cl. 110-271.000.

Joseph, Bernard W.: *See*—
Lewis, Robert W.; Joseph, Bernard W.; and Faxvog, Frederick R., 4,097,750, Cl. 250-548.000.

Jozat, Walter: *See*—
Anderka, Gerold; Hampel, Horst; Jozat, Walter; and Straszewski, Klaus, 4,097,874, Cl. 346-140.00R.

Jukkola, Walfred Wilhelm, to Dorr-Oliver Incorporated. Fluidized bed process heater. 4,096,909, Cl. 165-76.000.

Junod, Louis. Door with flexible wound sections. 4,096,902, Cl. 160-122.000.

K. R. Komarek, Inc.: *See*—
Komarek, Karl R., 4,097,215, Cl. 425-471.000.

Kaarlela, Willard Oswald; and Helton, Eugene L., to Caterpillar Tractor Co. Cartridge retaining means for earthworking tips. 4,096,653, Cl. 37-142.00A.

Kabushiki Kaisha Hoya Lens: *See*—
Akaba, Hayao; Ikeda, Akira; and Lee, Masayoshi, 4,096,684, Cl. 51-101.0LG.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Tsukiji, Yoshihiro, 4,097,175, Cl. 408-23.000.

Kabushiki Kaisha Sega Enterprises: *See*—
Ochi, Shikanosuke, 4,097,047, Cl. 273-127.00R.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Horikiri, Kazuhito; Hirasawa, Hiroshi; and Fujiwara, Minoru, 4,096,769, Cl. 74-801.000.

Kaiser Aluminum & Chemical Corporation: *See—*
Dorsey, Geoffrey A., Jr., 4,097,312, Cl. 148-6.270.

Kakizaki, Tetsuji: *See—*
Yui, Hiroshi; Kakizaki, Tetsuji; Sano, Hironari; Arai, Masakazu; and Matsui, Hiroshi, 4,097,554, Cl. 260-878.00R.

Kakui, Kuniaki, to Toyo Kogyo Co., Ltd. Casing for liquid-cooled rotary piston engines. 4,097,207, Cl. 418-83.000.

Kalal, Jaroslav: *See—*
Drobnik, Jaroslav; Kopecek, Jindrich; Labsky, Jiri; Rejmanova, Pavla; Exner, Josef; and Kalal, Jaroslav, 4,097,470, Cl. 260-78.00A.

Kalkbrenner, Francis William, to General Electric Company. Low resistance, durable gate contact pad for thyristors. 4,097,887, Cl. 357-38.000.

Kaminski, Elton George, to Stolle Corporation, The. Ecological easy-open can end. 4,096,967, Cl. 220-269.000.

Kamiuchi, Junichi: *See—*
Akiyama, Keiichi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujii, Takara, 4,097,545, Cl. 260-830.00P.

Kanaoka, Yuichi, to Teika Seiyaku Kabushiki Kaisha. N-(3-fluoranthyl)maleimide; a fluorescent reagent for the studies of thiol compounds. 4,097,488, Cl. 260-326.50C.

Kanazawa, Takato: *See—*
Kobayashi, Tetsu; Kanazawa, Takato; and Tsuboi, Makoto, 4,097,707, Cl. 219-10.55B.

Kandler, Joachim: *See—*
Wortmann, Joachim; Dany, Franz-Josef; and Kandler, Joachim, 4,097,400, Cl. 252-182.000.

Kane, William Paul, to Du Pont de Nemours, E. I., and Company. Heat-sealable vinylidene chloride copolymer coating composition. 4,097,433, Cl. 260-23.0AR.

Kaneko, Norio: *See—*
Tanaka, Tsunemitsu; Nakagawa, Tetsuo; Abiko, Shiro; and Kaneko, Norio, 4,097,366, Cl. 208-127.000.

Kano, Yasunao, to Sumitomo Metal Industries, Ltd. Stripper guides for rolling mill. 4,096,725, Cl. 72-250.000.

Kansai Paint Co., Ltd.: *See—*
Ito, Hitoshi; and Kogure, Hideo, 4,097,287, Cl. 106-14.140.

Kanzaki Kokyukoki Mfg. Co., Ltd.: *See—*
Yano, Kazuhiko; Otsuki, Kazuhiko; and Ohashi, Ryota, 4,096,882, Cl. 137-596.120.

Kao, Charles T.: *See—*
Lafevers, James O.; and Kao, Charles T., 4,097,910, Cl. 360-126.000.

Kao, Jar-Lin; and Leonard, John Joseph, to Atlantic Richfield Company. Liquid phase oxidation of unsaturated aliphatic aldehydes to unsaturated aliphatic acids. 4,097,523, Cl. 260-530.00N.

Kao Soap Co., Ltd.: *See—*
Mizutani, Hiroshi; Tamura, Masaru; and Saegusa, Katsumi, 4,097,397, Cl. 252-153.000.
Tsuto, Keiichi; Majima, Kanji; and Imamura, Shigeyasu, 4,097,242, Cl. 23-283.000.
Tsutsumi, Hisao; Hayashi, Shizuo; Nakayama, Hirokazu; and Ukena, Toshinao, 4,097,403, Cl. 252-312.000.

Kao, Wen-Ling: *See—*
Strike, Donald P.; and Kao, Wen-Ling, 4,097,514, Cl. 260-464.000.

Kaplan, David; Brezack, Irving; Young, Nathan H., deceased; by Kaplan, David, executor; by Brezack, Irving, executor; and Wapner, Herbert H., to Baka Manufacturing Company, Inc. Band for anchoring a cathetor or any other tubular device to the body. 4,096,863, Cl. 128-349.00R.

Kaplan, David, executor: *See—*
Kaplan, David; Brezack, Irving; Young, Nathan H., deceased; Kaplan, David, executor; Brezack, Irving, executor; and Wapner, Herbert H., 4,096,863, Cl. 128-349.00R.

Karch, John A.: *See—*
Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,097,244, Cl. 44-1.00R.

Karges, John, Jr.: *See—*
Raines, William L.; and Karges, John, Jr., 4,096,652, Cl. 37-41.000.

Karl Kroyer St. Anne's Limited: *See—*
Curry, Harold George; Attwood, Brian William; White, Derek Graham Walter; Christensen, John Mosgaard; and Kroyer, Karl Kristian Kobs, 4,097,640, Cl. 428-219.000.

Karlen, Urs: *See—*
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, 4,097,229, Cl. 8-1.00A. . .

Karll, Bent, to Danfoss A/S. Compressor refrigeration plant. 4,096,708, Cl. 62-275.000.

Karpov, Vladilen Efremovich: *See—*
Rivkin, Ilya Yakovlevich; Aisin, Shamil Mustafovich; Garkusha, Olga Ivanovna; Dondoshansky, Alexandr Lvovich; Zellis, Evgeny Alfredovich; Karpov, Vladilen Efremovich; Sorokin, Vladimir Konstantinovich; and Shishkin, Oleg Petrovich, 4,096,745, Cl. 73-194.00B.

Karrer, Friedrich: *See—*
Farooq, Saleem; and Karrer, Friedrich, 4,097,581, Cl. 424-278.000.

Kast, Howard B.: *See—*
Coffinberry, George A.; and Kast, Howard B., 4,096,910, Cl. 165-81.000.

Kasten, Roy F., Jr.: *See—*
Furbee, Avery D.; Kasten, Roy F., Jr.; and Pleil, Viktor W., 4,097,759, Cl. 313-60.000.

Katagiri, Kazuharu: *See—*
Kitahara, Makoto; Ishikawa, Shozo; Katagiri, Kazuharu; Arita, Tetsuo; and Masubuchi, Shoji, 4,097,646, Cl. 428-323.000.

Katagiri, Tohru, to Sankyo Kogaku Kogyo Kabushiki Kaisha. Focussing apparatus for cameras. 4,097,881, Cl. 354-155.000.

Kataura, Yasuji: *See—*
Ototani, Tohei; and Kataura, Yasuji, 4,097,268, Cl. 75-57.000.

Kato, Tomomi: *See—*
Sato, Mituhiro; and Kato, Tomomi, 4,097,785, Cl. 318-89.000.

Kaufmann, Harold, to Houdaille Industries, Inc. Turret punches. 4,096,774, Cl. 83-552.000.

Kawamoto, Masahiro: *See—*
Matsumoto, Shoichi; Kawamoto, Masahiro; and Mizunoya, Kiyoshi, 4,097,128, Cl. 350-335.000.

Kawamoto, Tamio, to Nissan Motor Company, Limited. Torque converter fluid control system for power transmission system. 4,096,693, Cl. 60-337.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Higuchi, Kousaku; Sato, Satoshi; and Wada, Susumu, 4,097,031, Cl. 266-226.000.

Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Dual-function variable resistor in automatic/manual camera shutter control circuit. 4,097,877, Cl. 354-50.000.

Kazami, Koichi: *See—*
Imazeki, Kazuyoshi; and Kazami, Koichi, 4,097,816, Cl. 331-2.000.

Keane, Eunice R. Spin the saucer. 4,096,659, Cl. 46-47.000.

Keene, Frederick J., to Du Pont de Nemours, E. I., and Company. Barrier coatings. 4,097,297, Cl. 106-177.000.

Kell, Nathaniel B., to General Motors Corporation. Hypocycloidal reduction gearing. 4,096,763, Cl. 74-69.000.

Keller Corporation, The: *See—*
Keller, Leonard J., 4,097,217, Cl. 431-11.000.

Keller, Harold A.: *See—*
Saunders, Robert J.; and Keller, Harold A., 4,096,796, Cl. 100-35.000.

Keller, Leonard J., to Keller Corporation, The. Method for converting combustor from hydrocarbonaceous fuel to carbonaceous fuel. 4,097,217, Cl. 431-11.000.

Kellermann, Arnold LeRoy; and McDonald, David Ian, to Cincinnati Milacron Inc. Mechanism to transfer workpieces between locations. 4,096,953, Cl. 214-1.0BT.

Kelley Company, Inc.: *See—*
Rozga, Vincent E., 4,097,042, Cl. 271-171.000.

Kelly, Clifford G. Clamp arrangement and system for sheet material. 4,097,169, Cl. 403-391.000.

Kelly, Emmett J.; and Smith, Leonard R., to Goodyear Tire & Rubber Company, The. Machine for spirally wrapping a continuous element around an annular tire bead. 4,097,321, Cl. 156-136.000.

Kelly, John Joseph: *See—*
Gerlach, Gijsbertus; and Kelly, John Joseph, 4,097,394, Cl. 252-79.500.

Kennecke, Mario: *See—*
Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,097,334, Cl. 195-51.00G.

Kennecott Copper Corporation: *See—*
Rappas, Alkis S.; and Pemsler, J. Paul, 4,097,272, Cl. 75-119.000.

Kenneday, John W.; Kinney, Charles W.; Scott, Floyd L., Jr.; and Schmuck, Phillip W., to Baker International Corporation. Hydraulically set liner hanger and running tool with backup mechanical setting means. 4,096,913, Cl. 166-290.000.

Kent, David: *See—*
Kuntz, Donald L.; and Kent, David, 4,097,690, Cl. 179-2.00A.

Kerb, Ulrich; Wiechert, Rudolf; and Engelfried, Otto, to Schering Aktiengesellschaft. $\Delta^{9(11)}$-5α-D-homo-20-keto steroids. 4,097,678, Cl. 560-257.000.

Kern, Werner; and Tracy, Chester Edwin, to RCA Corporation. Combination glass/low temperature deposited $Si_xN_yH_zO_z$ passivating overcoat with improved crack and corrosion resistance for a semiconductor device. 4,097,889, Cl. 357-54.000.

Kerr, Ralph O.: *See—*
Barone, Bruno J.; and Kerr, Ralph O., 4,097,498, Cl. 260-346.750.

Kerwick, Donald P.: *See—*
Brungard, Alvin J.; Galloway, Richard M.; and Kerwick, Donald P., 4,096,614, Cl. 29-156.80R.

Keshock, Edward G. Collapsible hat. 4,096,590, Cl. 2-180.000.

Kesling, Haven Sylvester, Jr., to Atlantic Richfield Company. Process for the preparation of formamides. 4,097,524, Cl. 260-561.00R.

Kesten, Stephen J.: *See—*
Sircar, Jagadish C.; Kesten, Stephen J.; and Zinnes, Harold, 4,097,441, Cl. 260-332.20A.

Kesting, Lawrence W., to United States of America, Army. Solid propellant air turbo rocket. 4,096,803, Cl. 102-49.500.

Keszler, Balazs: *See—*
Simon, Artur; Sarosi, Gyula; Keszler, Balazs; Toth, Attila; and Rethy, Maria, 4,097,658, Cl. 526-143.000.

Ketchum, Elmer, Jr. Diffuser for fuel burners. 4,096,996, Cl. 239-406.000.

Keuffel & Esser Company: *See—*
Erickson, Kent E., 4,097,734, Cl. 250-237.00G.

Keyworth, Donald A.; Di Bella, Eugene P.; and Rosen, Marvin, to Tenneco Chemicals, Inc. Flame-retardant resinous compositions. 4,097,451, Cl. 260-45.70R.

Keznickl, Eduard: *See—*
Schild, Josef; Scheiber, Robert; Schmidt, Harald; Drasch, Josef; and Keznickl, Eduard, 4,097,906, Cl. 360-13.000.

Khayat, Ali, to Ralston Purina Company. Method of removing headspace volatiles and analysis thereof. 4,096,734, Cl. 73-23.100.
Kieft, Alvin J.; Cline, Richard L.; and Rabito, Thomas G., to Goodyear Tire & Rubber Company, The. Sandable polyurethane adhesive composition and laminates made therewith. 4,097,442, Cl. 260-37.00N.
Kikuchi, Yoshinobu: *See*—
Yamada, Akitoshi; Goto, Toshiyuki; Kimura, Yoichi; and Kikuchi, Yoshinobu, 4,097,689, Cl. 179-1.00G.
Kikumoto, Ryoji: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,097,472, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,097,591, Cl. 424-177.000.
Kilgore Corporation: *See*—
Rudy, Richard, 4,097,043, Cl. 272-113.000.
Kim, Raymond W. H.; Klein, Robert A.; Lodge, Edward H.; Lueders, Arthur L.; and Woodier, James G., to Bell & Howell Company. Projector molded chassis. 4,097,132, Cl. 352-242.000.
Kimball International, Inc.: *See*—
Blessinger, James Edward, 4,096,789, Cl. 83-478.000.
Kimstock, Inc.: *See*—
Clow, William E., 4,096,980, Cl. 224-39.000.
Kimura, Yoichi: *See*—
Yamada, Akitoshi; Goto, Toshiyuki; Kimura, Yoichi; and Kikuchi, Yoshinobu, 4,097,689, Cl. 179-1.00G.
Kindermann, Joseph C.; and Colling, Ronald L., to General Motors Corporation. Ignition system for use with fuel injected-spark ignited internal combustion engines. 4,096,841, Cl. 123-148.00E.
King, David P.: *See*—
Barker, Robert I.; and King, David P., 4,096,739, Cl. 73-56.000.
King, Francis Kong; and Schmidt, Jon Jay, to International Business Machines Corporation. Magnetic transducer with inner and outer magnetic medium cooperating surface zones of different convexity. 4,097,90^{6}, Cl. 360-99.000.
Kingsley, William, to Xerox Corporation. Photoconductive belt incrementing apparatus. 4,097,138, Cl. 355-3.0DR.
Kinney, Charles W.: *See*—
Kenneday, John W.; Kinney, Charles W.; Scott, Floyd L., Jr.; and Schmuck, Phillip W., 4,096,913, Cl. 166-290.000.
Kirchhoff, Franz-Josef; and Brandt, Joachim, to Apparatebau Rothemuhle Brandt & Kritzler. Electrostatic precipitator. 4,097,252, Cl. 55-135.000.
Kirkpatrick, Joel L., to Gulf Oil Corporation. 5-Acylamino-1,3,4-thiadiazole-2-sulfonamides and use as herbicides. 4,097,263, Cl. 71-90.000.
Kirkpatrick, Joel L.; and Doyle, Jr.; William C., to Gulf Oil Corporation. Chloro-tert.butyl-1,3,4-thiadiazoleurea herbicides and use to combat unwanted vegetation. 4,097,264, Cl. 71-90.000.
Kirmser, Philip George; and Hu, Kuo-Kuang. Method and apparatus for reproducing desired ideographs. 4,096,934, Cl. 400-110.000.
Kishida, Katsuhiro; Takao, Hiroshi; Togawa, Kimmochi; and Matoba, Kazuo, to Nissan Motor Company, Limited. Article and method of forming porous coating on electrode layer of concentration cell type oxygen sensor. 4,097,353, Cl. 204-195.00S.
Kishner, Stanley J., to Kollmorgen Corporation. Spectrophotometer with visual spectrum display. 4,097,152, Cl. 356-96.000.
Kistner, Heinz; and Volk, Heinrich, to Meto International GmbH. Detent device for a key shaft of a printing mechanism. 4,096,800, Cl. 101-110.000.
Kita, Yasuhiro: *See*—
Ishizuka, Kohei; Kita, Yasuhiro; Takasaki, Yoshitaka; and Nakagawa, Junichi, 4,097,824, Cl. 333-28.00R.
Kitahara, Makoto; Ishikawa, Shozo; Katagiri, Kazuharu; Arita, Tetsuo; and Masubuchi, Shoji, to Copyer Co., Ltd. Electrostatic recording material having a dielectric copolymer coated layer. 4,097,646, Cl. 428-323.000.
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; and Shinozaki, Nobuo, to Seiko Koki Kabushiki Kaisha. Construction of electromagnetic driving device. 4,097,755, Cl. 310-114.000.
Kitajima, Sigenori: *See*—
Norimatsu, Hideaki; Nakamura, Mitsuo; Kondo, Toshio; Masuda, Akira; and Kitajima, Sigenori, 4,096,834, Cl. 123-32.0EE.
Kitamoto, Tatsuji: *See*—
Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Dezawa, Shin-ichiro, 4,097,650, Cl. 428-336.000.
Kitazawa, Yoichi; Sato, Takeshi; and Tsuji, Hisao, to Bridgestone Tire Co., Ltd. Light weight pneumatic tire having a thin side wall rubber. 4,096,899, Cl. 152-354.00R.
Kitsukawa, Hiroshi: *See*—
Nagao, Shozo; Iwamatsu, Junkichi; Kitsukawa, Hiroshi; Nishizaki, Kozo; Watanabe, Yuichi; and Okamoto, Yasunori, 4,097,074, Cl. 285-231.000.
Klaue, Hermann. Actuator and cooling structure for disk brakes. 4,096,926, Cl. 188-71.400.
Klaus, Gerald R., to Fellowes Manufacturing Company. Drawer pull and label holder. 4,096,603, Cl. 16-110.00R.
Klein, Karl P.: *See*—
Rogic, Milorad M.; Demmin, Timothy R.; and Klein, Karl P., 4,097,517, Cl. 260-465.400.
Klein, Robert A.: *See*—
Kim, Raymond W. H.; Klein, Robert A.; Lodge, Edward H.; Lueders, Arthur L.; and Woodier, James G., 4,097,132, Cl. 352-242.000.
Klein, Roy W., to Pittway Corporation. Sensitivity compensated fire detector. 4,097,851, Cl. 340-237.00S.
Klein, William Richard; Kotila, Carl Leroy; and Krams, Ira Leslie, to Tideland Signal Corporation. Glass enclosed solar cell panel. 4,097,308, Cl. 136-89.00H.
Klendauer, Wolfgang: *See*—
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Schroder, Martin, 4,097,623, Cl. 427-230.000.
Kletschka, Harold D.; and Rafferty, Edson D., to Bio-Medicus, Inc. Fluid carrying surgical instrument of the forceps type. 4,096,864, Cl. 128-354.000.
Kline, Richard H., to Goodyear Tire & Rubber Company, The. 2,6-Di-tert-alkyl-4-vinylphenols as polymerizable antioxidants. 4,097,464, Cl. 260-62.000.
Kline, Richard H., to Goodyear Tire & Rubber Company, The. Antioxidants and process of preparing said antioxidants. 4,097,527, Cl. 260-570.80R.
Klockner-Werke AG: *See*—
Langhammer, Hans-Jurgen, 4,097,028, Cl. 266-47.000.
Klomp, Edward D., to General Motors Corporation. Variable spray direction fuel injection nozzle. 4,096,995, Cl. 239-94.000.
Klug, Frederic J.: *See*—
Huseby, Irvin C.; and Klug, Frederic J., 4,097,291, Cl. 106-38.900.
Huseby, Irvin C.; and Klug, Frederic J., 4,097,292, Cl. 106-38.900.
Kluge, Arthur Frederick: *See*—
Muchowski, Joseph Martin; and Kluge, Arthur Frederick, 4,097,579, Cl. 424-274.000.
KM-Engineering AG: *See*—
Uehlinger, Werner; and Wendelspiess, Pius, 4,096,731, Cl. 72-405.000.
Knestele, Leopold. Cleaning apparatus for carpets, upholstery and the like. 4,096,601, Cl. 15-320.000.
Kneubuhler, Werner: *See*—
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, 4,097,229, Cl. 8-1.00A.
Knorr, Volker, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Method and apparatus for securing mining machines employed on inclined or steep seams. 4,097,091, Cl. 299-1.000.
Knowles, Thomas A.: *See*—
Scott, Robert N.; and Knowles, Thomas A., 4,097,406, Cl. 252-351.000.
Knox, Robert M.; and Toulios, Peter P., to Epsilon Lambda Electronics Corp. Insular waveguide ring resonator filter. 4,097,826, Cl. 333-73.00R.
Kobayashi, Tetsu; Kanazawa, Takato; and Tsuboi, Makoto, to Matsushita Electric Industrial Co., Ltd. Apparatus for controlling heating time utilizing humidity sensing. 4,097,707, Cl. 219-10.55B.
Kobel, Hans-Rudolf: *See*—
Ebel, Eckhard; Kobel, Hans-Rudolf; and Widmer, Ernst, 4,097,369, Cl. 208-180.000.
Kobzina, John W., to Chevron Research Company. 3,5-Dimethyl-2-thienylcarboxanilide and 3,5-dimethyl-2-thienyl-(N-haloalkylthiocarboxanilide) herbicides. 4,097,265, Cl. 71-90.000.
Kochendorfer, Donald P., to General Motors Corporation. Refrigerator heater tube grommet. 4,097,096, Cl. 312-214.000.
Kochendorfer, Heinrich: *See*—
Sandau, Hartmut; Weigert, Wilhelm; Steinel, Winfried; Kraisel, August; Ritter, Klaus; Gaub, Erwin; and Kochendorfer, Heinrich, 4,096,787, Cl. 92-260.000.
Kockums Automation AB: *See*—
Strandberg, Per, 4,097,159, Cl. 356-167.000.
Koenig, Neale F.: *See*—
Perica, Jacob E.; Poyer, Wayne F.; and Koenig, Neale F., 4,096,854, Cl. 128-2.05T.
Kogure, Hideo: *See*—
Ito, Hitoshi; and Kogure, Hideo, 4,097,287, Cl. 106-14.140.
Kogyo Kaihatsu Kenkyusho (Industrial Research Institut): *See*—
Sakai, Tomoya; and Negishi, Naoki, 4,097,541, Cl. 260-668.00R.
Tamura, Takaaki; Fujita, Norihiko; Matsuura, Chihiro; Ito, Wataru; and Negishi, Naoki, 4,097,576, Cl. 423-239.00A.
Koike, Wataro; Takayama, Masami; Ohashi, Hideaki; and Matsui, Sadayoshi, to Ihara Chemical Kogyo Kabushiki Kaisha. Curing agents for polyurethane foams and elastomers and process of use. 4,097,426, Cl. 260-2.5AM.
Koizumi, Hideaki; Arai, Yoji; and Murayama, Seiichi, to Hitachi, Ltd. Atomic spectrum light source device. 4,097,781, Cl. 315-176.000.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Wada, Tasaku, 4,097,904, Cl. 358-294.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,097,903, Cl. 358-261.000.
Yamaguchi, Masahisa; and Watanabe, Tatsuo, 4,097,804, Cl. 325-15.000.
Kollar, Ernest Paul; and Kollar, Julie Ann. False tenon structure. 4,096,674, Cl. 52-233.000.
Kollar, Julie Ann: *See*—
Kollar, Ernest Paul; and Kollar, Julie Ann, 4,096,674, Cl. 52-233.000.
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, to Ciba-Geigy AG. Methods for dyeing or printing using amino-anthraquinone reactive disperse dyes. 4,097,229, Cl. 8-1.00A.
Kollmorgen Corporation: *See*—
Kishner, Stanley J., 4,097,152, Cl. 356-96.000.
Kollmorgen Technologies Inc.: *See*—
Burr, Robert Page, 4,097,684, Cl. 174-68.500.

Komarek, Karl R., to K. R. Komarek, Inc. Segmented briquetting roll. 4,097,215, Cl. 425-471.000.

Komatsu, Koei; Itoyama, Kenji; Hirota, Jun; and Nishijima, Akio, to Japan Synthetic Rubber Co., Ltd.; and Denki Kagaku Kogyo Kabushiki Kaisha. Process for producing conjugated diolefinic polymers. 4,097,661, Cl. 526-175.000.

Komeya, Katsutoshi; and Inoue, Hiroshi, to Tokyo Shibaura Electric Co., Ltd. Method for manufacturing heat-resistant reinforced composite materials. 4,097,293, Cl. 106-43.000.

Kondo, Eiichi: *See*—
Takasu, Yoshio; and Kondo, Eiichi, 4,097,277, Cl. 96-1.50R.

Kondo, Shigeo: *See*—
Megumi, Takeaki; and Kondo, Shigeo, 4,097,457, Cl. 260-47.0XA.

Kondo, Toshihiro, to Fuji Photo Film Co., Ltd., a part interest. Device in a camera for imparting pictures on a photographic film with a top-and-bottom indication. 4,097,879, Cl. 354-106.000.

Kondo, Toshio: *See*—
Norimatsu, Hideaki; Nakamura, Mitsuo; Kondo, Toshio; Masuda, Akira; and Kitajima, Sigenori, 4,096,834, Cl. 123-32.0EE.

Konttinen, Aarne Ilmari; Goverde, Bastiaan Cornelis; and Janssen, Peter Silvester Lambertus, to Akzona Incorporated. Fluorimetric demonstration and determination of a reduced coenzyme or derivative in an aqueous system. 4,097,338, Cl. 195-103.50R.

Kontz, Robert F., to Owens-Illinois, Inc. Method and apparatus for assembling a support base to the bottom of a plastic container. 4,096,620, Cl. 29-428.000.

Kontz, Robert F.: *See*—
Dickson, Andrew C.; and Kontz, Robert F., 4,097,570, Cl. 264-296.000.

Koob, Robert W.; and Husson, Alan L., to Westinghouse Electric Corp. Elevator system with detector for indicating relative positions of car and counterweight. 4,096,925, Cl. 187-29.00R.

Kopacz, Bernard F.: *See*—
Riuli, Arduino E.; and Kopacz, Bernard F., 4,096,962, Cl. 215-32.000.

Kopecek, Jindrich: *See*—
Drobnik, Jaroslav; Kopecek, Jindrich; Labsky, Jiri; Rejmanova, Pavla; Exner, Josef; and Kalal, Jaroslav, 4,097,470, Cl. 260-78.00A.

Kopich, Leonard F., to General Motors Corporation. Variable timing device particularly for engine camshafts. 4,096,836, Cl. 123-90.150.

Kornis, Gabriel: *See*—
Moon, Malcolm W.; and Kornis, Gabriel, 4,097,672, Cl. 548-377.000.

Korpel, Adrianus, to Zenith Radio Corporation. Focus correction system for video disc player. 4,097,730, Cl. 250-201.000.

Korsch, Helmut, to Braunschweigische Maschinenbauanstalt. Batch-type centrifuge. 4,097,303, Cl. 127-19.000.

Korshak, Marvin Stanley. Self-righting cups. 4,096,966, Cl. 220-69.000.

Korta, John, to Westinghouse Canada Limited. Adjustable vane assembly for a gas turbine. 4,097,187, Cl. 415-161.000.

Kosan Crisplant A/S: *See*—
Nielsen, Jacob August, 4,096,936, Cl. 198-356.000.

Kostrzewa, Michael: *See*—
Holst, Arno; and Kostrzewa, Michael, 4,097,667, Cl. 536-87.000.

Kotila, Carl Leroy: *See*—
Klein, William Richard; Kotila, Carl Leroy; and Krams, Ira Leslie, 4,097,308, Cl. 136-89.00H.

Kottmeyer, Richard E.: *See*—
Garrick, John R.; and Kottmeyer, Richard E., 4,097,209, Cl. 425-82.100.

Kovacs, Jeno: *See*—
Benko, Pal; Simonek, Ildiko; Pallos, Laszlo; Kovacs, Jeno; and Magyar, Karoly, 4,097,668, Cl. 542-418.000.

Kowalski, Anthony F.: *See*—
Frost, William F.; Masak, Raymond J.; Baurle, Herbert F.; and Kowalski, Anthony F., 4,097,866, Cl. 343-100.0LE.

Kowalski, Gunter, to U.S. Philips Corporation. Device for measuring absorption of radiation in a slice of a body. 4,097,747, Cl. 250-445.00T.

Kozakai, Asao: *See*—
Otsuka, Katsumi; Ishigami, Noriakira; and Kozakai, Asao, 4,097,841, Cl. 340-52.00C.

Kraft Foods Limited: *See*—
West, Simon Michael, 4,097,614, Cl. 426-422.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Bezold, Helmut, 4,097,712, Cl. 219-107.000.
Schabert, Hans-Peter; and Laurer, Erwin, 4,096,881, Cl. 137-492.000.

Krafzig, Rolf; Langer, Paul; and Leppich, Erhard, to Volkswagenwerk Aktiengesellschaft. Valve assembly for a shock absorber. 4,096,928, Cl. 188-282.000.

Krainski, Andrzej: *See*—
Siwak, Eugeniusz; Krainski, Andrzej; Lendzion, Krzysztof; and Wewior, Jerzy, 4,096,998, Cl. 239-533.300.

Kraisel, August: *See*—
Sandau, Hartmut; Weigert, Wilhelm; Steinel, Winfried; Kraisel, August; Ritter, Klaus; Gaub, Erwin; and Kochendorfer, Heinrich, 4,096,787, Cl. 92-260.000.

Krall, Heribert A.; and Maag, Helmut, to Technica-Guss GmbH. Strand withdrawal assembly for continuous casting plants. 4,096,907, Cl. 164-448.000.

Krambrock, Wolfgang; Schwedes, Hansjorg; Richter, Wolfgang; and Elgeti, Klaus, to Waeschle Maschinenfabrik GmbH. Method and apparatus for thermal treatment of or for matter-exchange with pourable material. 4,096,640, Cl. 34-10.000.

Kramer, Justin. Tape player time signal. 4,097,905, Cl. 360-12.000.

Krams, Ira Leslie: *See*—
Klein, William Richard; Kotila, Carl Leroy; and Krams, Ira Leslie, 4,097,308, Cl. 136-89.00H.

Kraska, Allen R.; and Schnur, Rodney C., to Pfizer Inc. Aromatic amidines as antiviral agents in animals. 4,097,525, Cl. 260-564.00R.

Krause, Thomas R.; Paananen, Eugene E.; and Burcz, John F., to Burroughs Corporation. Automatic gain control for photosensing devices. 4,097,731, Cl. 250-205.000.

Krause, Thomas R.; Paananen, Eugene E.; and Burcz, John F., to Burroughs Corporation. Automatic gain control for photosensing devices. 4,097,732, Cl. 250-205.000.

Krause, Werner A., to General Electric Company. Busway plug assembly. 4,097,103, Cl. 339-22.00B.

Krejci, Wayne E.: *See*—
DelPercio, Michael J.; and Krejci, Wayne E., 4,097,721, Cl. 219-366.000.

Krenitsky, Thomas Anthony; and Bushby, Stanley Robert Morris, to Burroughs Wellcome Co. Bacterial culture medium. 4,097,337, Cl. 195-100.000.

Krenzer, John; and Wu, Chin Ching, to Velsicol Chemical Corporation. Thiazolylimidazolidinone esters of furyl and thienyl substituted acids. 4,097,485, Cl. 260-306.80D.

Krenzer, John, to Velsicol Chemical Corporation. Herbicidal thiadiazolylimidazolidinone ester. 4,097,486, Cl. 260-306.80D.

Kressel, Henry: *See*—
Hawrylo, Frank Zygmunt; and Kressel, Henry, 4,097,636, Cl. 428-209.000.

Krisch, Burkhard: *See*—
Muller, Karl-Heinz; Rauch, Moriz V.; Krisch, Burkhard; and Veneklasen, Lee H., 4,097,739, Cl. 250-311.000.

Kroyer, Karl Kristian Kobs: *See*—
Curry, Harold George; Attwood, Brian William; White, Derek Graham Walter; Christensen, John Mosgaard; and Kroyer, Karl Kristian Kobs, 4,097,640, Cl. 428-219.000.

Krueger, John H. Paper towel holder. 4,097,002, Cl. 242-55.200.

Kruger, Gunther, to Steele Chemicals Co. Ltd. Steroid compounds and processes thereof. 4,097,477, Cl. 260-239.570.

Kruse, Robert L., to Monsanto Company. Polymer polyblend composition. 4,097,549, Cl. 260-876.00R.

Kubota, Ltd.: *See*—
Nagao, Shozo; Iwamatsu, Junkichi; Kitsukawa, Hiroshi; Nishizaki, Kozo; Watanabe, Yuichi; and Okamoto, Yasunori, 4,097,074, Cl. 285-231.000.

Kuchenbecker, Morris W., to American Can Company. Cook-in carton with integral removable section and blank therefor. 4,096,948, Cl. 206-622.000.

Kuchmas, John, Jr.; and Bubb, Gary E., to United States of America, Army. Laser screen. 4,097,800, Cl. 324-178.000.

Kuckens, Alexander, to Dagma GmbH & Co. Deutsche Automaten- und Getranke - Maschinen. Method of and apparatus for dispensing self-conserving liquids. 4,096,971, Cl. 222-1.000.

Kuhla, Donald E., to Pfizer Inc. Quaternary salts as hypoglycemic agents. 4,097,598, Cl. 424-256.000.

Kuhn, Leroy B., to Stauffer Chemical Company. Resin blend for making plastisols and organosols. 4,097,558, Cl. 260-899.000.

Kuklin, Ivan Alexandrov: *See*—
Sendov, Stoyan Hristov; Kuklin, Ivan Alexandrov; Nikolov, Ivan Angelov; Ivanov, Assen Ninov; Mirchev, Mircho Georgiev; and Kurtashev, Radoslav Borissov, 4,097,927, Cl. 366-247.000.

Kulina, Mark R., to Curtiss-Wright Corporation. Turbine rotor and blade configuration. 4,097,192, Cl. 416-175.000.

Kulkarni, Mohan V.; and Von Kamp, John, to Goodyear Tire & Rubber Company, The. Polyester-containing hot melt adhesive composition. 4,097,548, Cl. 260-873.000.

Kumamaru, Hiroyuki; Shioyama, Hiromu; and Hoshikawa, Masao, to Sumitomo Electric Industries, Ltd. Optical fiber cable. 4,097,119, Cl. 350-96.230.

Kuntz, Donald L.; and Kent, David, to Precision Components Inc. Intercommunication and alarm telephone system. 4,097,690, Cl. 179-2.00A.

Kurata, Noboru, to Honda Giken Kogyo Kabushiki Kaisha. Device for winding a spiral spring to start an engine. 4,096,842, Cl. 123-179.00S.

Kuroha, Noboru, to Nippon Kogaku K.K. Microscope stage. 4,097,116, Cl. 350-86.000.

Kurstein, Peter: *See*—
Brauer, Harald Otto Christian; Jensen, Knud Sejr; Andreasen, Torben; Jensen, Hilmer; Greve, Mogens; and Kurstein, Peter, 4,097,320, Cl. 156-109.000.

Kurtashev, Radoslav Borissov: *See*—
Sendov, Stoyan Hristov; Kuklin, Ivan Alexandrov; Nikolov, Ivan Angelov; Ivanov, Assen Ninov; Mirchev, Mircho Georgiev; and Kurtashev, Radoslav Borissov, 4,097,927, Cl. 366-247.000.

Kurumada, Tomoyuki: *See*—
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,097,587, Cl. 260-45.80A.

Kusakabe, Haruhiko; Makita, Masashi; and Ueda, Masutoshi, to Toray Industries, Inc. Woven fabric utilizing a particular textured yarn and method for manufacturing the same. 4,096,890, Cl. 139-435.000.

Kuwabara, Takao: *See*—
Namikas, Daumantas; and Kuwabara, Takao, 4,097,183, Cl. 415-1.000.

Kwieraga, James A., to TRW Inc. Chaser cutting apparatus. 4,097,180, Cl. 408-154.000.

Kyorin Pharmaceutical Co., Ltd.: *See*—
Irikura, Tsutomu, 4,097,483, Cl. 260-296.00H.

Labsky, Jiri: *See*—
Drobnik, Jaroslav; Kopecek, Jindrich; Labsky, Jiri; Rejmanova, Pavla; Exner, Josef; and Kalal, Jaroslav, 4,097,470, Cl. 260-78.00A.

Lafevers, James O.; and Kao, Charles T., to Recognition Equipment Incorporated. Single gap magnetic read head. 4,097,910, Cl. 360-126.000.

Lagerstedt, John Arne, to Atlas Copco Aktiebolag. Drill string holder. 4,096,608, Cl. 24-249.00R.

Lahut, Joseph A.: *See*—
Berkowitz, Ami E.; Lahut, Joseph A.; and Wang, Jish Min, 4,097,871, Cl. 346-74.100.

Laing, Alfred M.: *See*—
Goldman, Alex; and Laing, Alfred M., 4,097,392, Cl. 252-62.620.

Lair, Wilbert M., to Electronized Chemicals Corporation. Method of coating flexible sleeving. 4,097,564, Cl. 264-22.000.

Lake, Ivan James Samuel, to Imperial Chemical Industries Limited. Production of alkylbenzenes. 4,097,542, Cl. 260-671.00M.

Lam, Hsiao-Ling; and Pallos, Ferenc M., to Stauffer Chemical Company. N-tetrachlorofluoroethylthio-halo-benzoyl anilides and their use as fungicides. 4,097,512, Cl. 260-453.0RW.

Lamont, Charles Edward. Internal combustion engine method and apparatus. 4,096,835, Cl. 123-52.00B.

Lamoureux, William Roger; and Trushell, James Bryce, to International Business Machines Corporation. Gas panel single ended drive systems. 4,097,856, Cl. 340-324.00M.

Lampen, James L.; Jerinic, George; and Thoren, Glenn R., to Raytheon Company. Coaxial line IMPATT diode oscillator. 4,097,821, Cl. 331-101.000.

Lampen, James L.: *See*—
Jerinic, George; Thoren, Glenn R.; Sullivan, Francis J., Jr.; and Lampen, James L., 4,097,823, Cl. 332-9.00R.
Thoren, Glenn R.; Lampen, James L.; and Jerinic, George, 4,097,817, Cl. 331-56.000.

Lamy, Henri, to Elf Union. Heating and cooling enclosure for a gas chromatographic column. 4,096,908, Cl. 165-64.000.

Lamy, Jacques Edouard, to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris". Laying of underwater pipelines. 4,096,705, Cl. 61-111.000.

Lang, Karl: *See*—
Bartels, Hermann; Gallati, Fritz; Lang, Karl; and Rutishauser, Heinz, 4,096,972, Cl. 222-135.000.

Langdon, Howard S.: *See*—
Veldman, Donald Richard; and Langdon, Howard S., 4,097,112, Cl. 339-246.000.

Langenbach, Erwin; and Sackmann, Karl-Hans, to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik. Door securing light barrier. 4,097,733, Cl. 250-221.000.

Langer, Paul: *See*—
Krafzig, Rolf; Langer, Paul; and Leppich, Erhard, 4,096,928, Cl. 188-282.000.

Langhammer, Hans-Jurgen, to Klockner-Werke AG. Method of melting and apparatus therefor. 4,097,028, Cl. 266-47.000.

Langlitz, Karlheinz: *See*—
Beggs, James Ingram; Langlitz, Karlheinz; Schmitz, Gunter; and Jansa, Wolfgang, 4,096,918, Cl. 177-145.000.

Lapp, John; and Sadler, Fred S., to McGraw-Edison Company. Electrical capacitor having an impregnated dielectric. 4,097,912, Cl. 361-318.000.

Lapp, John; and Sadler, Fred S., to McGraw-Edison Company. Electrical capacitor having an impregnated dielectric system. 4,097,913, Cl. 361-318.000.

Lapple, Walter Christian, to Babcock & Wilcox Company, The. Disperser. 4,097,092, Cl. 302-25.000.

Larmit, Adrianus Johannes Franciscus, to Ruti-te Strake B.V. Weaving loom. 4,096,889, Cl. 139-435.000.

Larson, Douglas A., to Eaton Corporation. Viscous damped crash sensor unit with inertia switch. 4,097,699, Cl. 200-61.45R.

Larson, Kenneth A. Deterrent composition, method of using same, and article coated thereby. 4,097,607, Cl. 424-324.000.

Larson, Richard E., to Cherne Industrial, Inc. Dual outlet check valve assembly. 4,096,997, Cl. 239-413.000.

Larsson, Lars-Goran; and Sorensen, Frede, to Asea AB. Device for controlling the peripheral speed in rotating objects. 4,097,787, Cl. 318-332.000.

Lasky, Daniel J.; and Wright, Philip R., to Adex Corporation. Apparatus and method for automatically processing X-ray film. 4,097,884, Cl. 354-323.000.

Latassa, Frank M., to GTE Sylvania Incorporated. Fluorescent lamp containing a cathode heater circuit disconnect device. 4,097,779, Cl. 315-106.000.

Laucke, Ivan. Retainer for punch and die sets. 4,096,776, Cl. 83-698.000.

Laurer, Erwin: *See*—
Schabert, Hans-Peter; and Laurer, Erwin, 4,096,881, Cl. 137-492.000.

Lawson, Michael B., to Halliburton Company. Formulation for the dissolution of gypsum. 4,096,869, Cl. 134-3.000.

Lawton, William R. Heat sensitive recording composition containing a complexed phenolics and a spiropyran or leuco lactone. 4,097,288, Cl. 106-21.000.

Laycraft, Kevin Wendell. Ski-supported vehicles. 4,097,055, Cl. 280-16.000.

Lazarus, Stanley David: *See*—
James, Leonard Evans; Balint, Laszlo Joseph; and Lazarus, Stanley David, 4,097,468, Cl. 260-75.00M.

Le Berre, Serge: *See*—
Moutou, Paul Cyril; Hareng, Michel; and Le Berre, Serge, 4,097,142, Cl. 355-45.000.

Ledex, Inc.: *See*—
Myers, John L., 4,097,833, Cl. 335-261.000.

Lee, Gim Fun, Jr.: *See*—
Haaf, William Robert; Lee, Gim Fun, Jr.; 260; and 260, 4,097,550, Cl. 260-876.00B.

Lee, Masayoshi: *See*—
Akaba, Hayao; Ikeda, Akira; and Lee, Masayoshi, 4,096,684, Cl. 51-101.0LG.

LeFevre, Robert J.: *See*—
Harvey, John K., Jr.; Watson, Morris T.; Economy, Constantine F.; and LeFevre, Robert J., 4,096,893, Cl. 141-90.000.

Leggett, Norman Derek: *See*—
Selway, Peter Richard; Chown, Martin; Epworth, Richard Edward; Leggett, Norman Derek; and Sunak, Harish Ram Dass, 4,097,891, Cl. 357-81.000.

Legrand S.A.: *See*—
Brionne, Yves, 4,097,862, Cl. 340-396.000.

Leipzig, Theodore J., to Miles Laboratories, Inc. Synthesis of 5-substituted tetrazoles. 4,097,479, Cl. 544-366.000.

Leitner, Frank W.; and Childress, Bobby B. Thermal systems incorporating apparatus and methods for simulating time related temperatures. 4,097,723, Cl. 219-494.000.

Lelental, Mark: *See*—
Gardner, Sylvia Alice; and Lelental, Mark, 4,097,281, Cl. 96-48.0HD.

LeMay, Christopher Archibald Gordon, to EMI Limited. Radiographic apparatus having repetitive movement of the origin of the radiation. 4,097,744, Cl. 250-366.000.

Lemmon, John C.; Olson, Donald R.; and Zepernick, Dean E., to Hunt Valve Co., Inc. Cartridge valve. 4,096,880, Cl. 137-454.200.

Lendzion, Krzysztof: *See*—
Siwak, Eugeniusz; Krainski, Andrzej; Lendzion, Krzysztof; and Wewior, Jerzy, 4,096,998, Cl. 239-533.300.

Leonard, John Joseph: *See*—
Kao, Jar-Lin; and Leonard, John Joseph, 4,097,523, Cl. 260-530.00N.

L'Eplattenier, Francois: *See*—
von Zelewsky, Alexander; Frey, Christoph; and L'Eplattenier, Francois, 4,097,484, Cl. 260-299.000.

Leppich, Erhard: *See*—
Krafzig, Rolf; Langer, Paul; and Leppich, Erhard, 4,096,928, Cl. 188-282.000.

Lerch, Ulrich: *See*—
Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 4,097,496, Cl. 260-345.80P.

Lermann, Peter: *See*—
Stemme, Otto; Lermann, Peter; and Ehgartner, Gabriele, 4,097,133, Cl. 352-243.000.

Lesiak, Walter J. Windshield wiper system activated lighting. 4,097,839, Cl. 340-52.00R.

Lessnig, Werner; Metz, Gunter; Spiegel, Willi; and Fleischer, Jurgen, to Bayer Aktiengesellschaft. Storage device for sample containers. 4,096,965, Cl. 220-20.000.

Lester Electrical of Nebraska, Inc.: *See*—
Calaway, Ward Martin, 4,097,792, Cl. 320-22.000.

Let-R-Edge of Canada, Ltd.: *See*—
Minogue, Robert W.; and Troyer, Lloyd E., 4,097,632, Cl. 428-130.000.

Letourneau, Georges: *See*—
Guillou, Jean Pierre; and Letourneau, Georges, 4,097,616, Cl. 426-548.000.

Levine, Alfred B. Multiple bladed retractable claw weapon. 4,096,629, Cl. 30-152.000.

Levine, James Lewis: *See*—
Garwin, Richard Lawrence; and Levine, James Lewis, 4,097,115, Cl. 350-6.700.

Levine, Marshall S.; and Faulkner, Albert A., to SmithKline Corporation. Slide smearing device. 4,096,824, Cl. 118-100.000.

Levine, Ronnie Stuart, to National Research Development Corporation. Mineralizing dental mouthrinse. 4,097,588, Cl. 424-52.000.

Levis, William W., Jr.: *See*—
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,097,399, Cl. 252-182.000.

Lewellyn, Morris Eugene: *See*—
Wang, Samuel Shang-Ning; and Lewellyn, Morris Eugene, 4,097,390, Cl. 252-60.000.

Lewis, Arthur E.; and Mallon, Richard G., to United States of America, Energy. Methods for minimizing plastic flow of oil shale during in situ retorting. 4,096,912, Cl. 166-259.000.

Lewis, Charles, Jr.; and Schuck, James M., to Monsanto Company. Production of serum albumin. 4,097,473, Cl. 260-122.000.

Lewis, Gary, to Energy Conversion Devices, Inc. Data storage and retrieval system. 4,097,846, Cl. 340-146.30H.

Lewis, John R., Jr.: *See*—
Fulmer, Leon F., Sr.; and Lewis, John R., Jr., 4,097,870, Cl. 343-792.000.

Lewis, Robert P.: *See*—
Daly, William P.; Lewis, Robert P.; and Pouliot, Oliver L., 4,097,236, Cl. 23-230.00L.

Lewis, Robert W.; Joseph, Bernard W.; and Faxvog, Frederick R., to General Motors Corporation. Method of orienting objects using optically smeared images. 4,097,750, Cl. 250-548.000.

L'Hommedieu, Jesse H.: *See—*
Fischman, Martin; and L'Hommedieu, Jesse H., 4,097,784, Cl. 315-368.000.

Liberty, Joseph C., Jr. Drive for power transmission. 4,096,932, Cl. 192-48.910.

Lieberman, Frank David; and Goodman, Herb Lou. Garment counter. 4,097,725, Cl. 235-92.0PK.

Lill, Melvin H., to FMC Corporation. Vehicle wheel aligner for measuring front wheel toe with respect to the rear wheel axis of rotation. 4,097,157, Cl. 356-152.000.

Lindal, Sir Walter. Mortise and tenon joint. 4,097,162, Cl. 403-264.000.

Linden, James C.: *See—*
Freytag, Arthur H.; and Linden, James C., 4,097,333, Cl. 195-33.000.

Lindmark, Magnus Carl Wilhelm. Switched mode power supply. 4,097,773, Cl. 307-296.00A.

Lindmayer, Joseph. Method of forming silicon solar energy cells. 4,097,310, Cl. 136-89.0SG.

Lindstrand, Bengt: *See—*
Netterstedt, Sture; and Lindstrand, Bengt, 4,096,681, Cl. 52-713.000.

Lipha, Lyonnaise Industrielle Pharmaceutique: *See—*
Briet, Philippe; Berthelon, Jean-Jacques; Depin, Jean-Claude; and Boschetti, Eugene, 4,097,582, Cl. 424-283.000.

Lipschutz, Paul, to Neiman S.A. Anti-theft device for a motorcycle helmet. 4,096,715, Cl. 70-59.000.

Little, Michael D. Motorcycle wheel alignment tool. 4,096,636, Cl. 33-169.00R.

Littman, Stanley; and Touval, Irving, to M & T Chemicals Inc. Novel phosphorus compounds and flame retardant compositions containing same. 4,097,560, Cl. 260-931.000.

Lo, John M.: *See—*
Cosco, Robert J.; Lo, John M ; and Hebert, Roger T., 4,097,774, Cl. 313-178.000.

Loboda, Walter J. Tire stud puller. 4,097,021, Cl. 254-22.000.

Locke, Gerald M., to Corning Glass Works. Quadriplanar capacitor. 4,097,915, Cl. 361-433.000.

Lodge, Edward H.: *See—*
Kim, Raymond W. H.; Klein, Robert A.; Lodge, Edward H.; Lueders, Arthur L.; and Woodier, James G., 4,097,132, Cl. 352-242.000.

Loebbaka, Gregory A.: *See—*
Adams, Stanley B.; Loebbaka, Gregory A.; and Morge, Michael P., 4,096,878, Cl. 137-351.000.

Loeffler, Herbert Heinz: *See—*
Serur, Juan Ricardo; and Loeffler, Herbert Heinz, 4,096,879, Cl. 137-391.000.

Lofquist, Robert Alden, to Allied Chemical Corporation. Ozone resistant, cationic dyeable nylon containing lithium, magnesium or calcium salts of sulfonated polystyrene copolymers. 4,097,546, Cl. 260-857.0UN.

Logan, Raymond D. Endless belt sanding tool. 4,096,668, Cl. 51-170.0EB.

Long, E. David, to Allied Chemical Corporation. Control system for electrically energized engine fuel. 4,096,830, Cl. 123-32.0EA.

Long, Terence Michael; and Henneveld, Clifford Hendrik, to Imperial Group Limited. Apparatus for pyrolyzing tobacco. 4,096,867, Cl. 131-171.00R.

Long, William C.: *See—*
Hoover, Michael C.; and Long, William C., 4,096,949, Cl. 209-74.00M.

Loomis, Robert W.: *See—*
Howard, John R.; and Loomis, Robert W., 4,096,675, Cl. 52-79.100.

Looschen, Floyd William, to Burroughs Corporation. Three-level to two-level decoder. 4,097,859, Cl. 340-347.0DD.

Lopes, Antone, Jr.; and Shepard, Richard Wilton, to Torrington Company, The. Knitting needle. 4,096,713, Cl. 66-121.000.

Loria, Adrian M.; and Thomas, Richard E., to A. B. Dick Company. Latent imaging master. 4,097,637, Cl. 428-212.000.

Lowe, Warren, to Chevron Research Company. Lubricating oil additive composition. 4,097,386, Cl. 252-32.70R.

Lu, Chin H., to Xerox Corporation. Magnetic toner particle coating process. 4,097,620, Cl. 427-127.C00.

Lucky Manufacturing Company: *See—*
Buckner, Walter E., 4,096,954, Cl. 214-38.0CC.

Luder, Friedrich Karl. Concrete constructional members. 4,096,703, Cl. 61-59.000.

Ludwig, George, to Tom McGuane Industries, Inc. Headlamp automatic delay system. 4,097,778, Cl. 315-82.000.

Lueders, Arthur L.: *See—*
Kim, Raymond W. H.; Klein, Robert A.; Lodge, Edward H.; Lueders, Arthur L.; and Woodier, James G., 4,097,132, Cl. 352-242.000.

Luhring Chicago Industries: *See—*
Molijor, Arvid A., 4,097,375, Cl. 210-23.00H.

Lummus Company, The: *See—*
Minkkinen, Ari A., 4,097,370, Cl. 208-255.000.

Lund, Bryant D., to E-Systems, Inc. Limit control apparatus. 4,097,786, Cl. 318-282.000.

Lunden, Clarence D., to Boeing Company, The. Method for testing radomes. 4,097,796, Cl. 324-58.00B.

Lunn, Norman Laurence; McCrea, Charles Jeffrey; Pregaman, Raymond David; and Turowski, Lawrence Edward, to St. Joe Minerals Corporation. Low melting temperature metal coating process, apparatus and product. 4,097,625, Cl. 427-360.000.

Luperti, Harry E.; and Manna, Robert E., to Pitney-Bowes, Inc. Means for self-positioning platen covers. 4,097,145, Cl. 355-75.000.

Lyden, Frank J., to Oil-Rite Corporation. Oiler assembly. 4,096,924, Cl. 184-58.000.

M & T Chemicals Inc.: *See—*
Dhake, Bhimashanker Gopal, 4,097,437, Cl. 260-29.20E.
Littman, Stanley; and Touval, Irving, 4,097,560, Cl. 260-931.000.

Maag, Helmut: *See—*
Krall, Heribert A.; and Maag, Helmut, 4,096,907, Cl. 164-448.000.

Machlett Laboratories, Inc., The: *See—*
Shapiro, Jonathan S.; Berluti, Vincent, Jr.; Pellegrino, Anthony; and Wagner, Howard G., 4,097,793, Cl. 324-20.00R.

MacIver, Bernard A., to General Motors Corporation. Ion implanted Schottky barrier diode. 4,096,622, Cl. 29-578.000.

Mackaness, James Bellamy. Internal combustion engine apparatus. 4,096,844, Cl. 123-193.00P.

MacLaury, Michael R.: *See—*
Factor, Arnold; MacLaury, Michael R.; and Webb, Jimmy L., 4,097,538, Cl. 568-726.000.

Magna International Inc.: *See—*
Putkowski, Ladislao W., 4,097,216, Cl. 425-568.000.

Magnesium Elektron Ltd.: *See—*
Phillips, Raymond Francis, 4,097,430, Cl. 260-17.00R.

Magyar, Karoly: *See—*
Benko, Pal; Simonek, Ildiko; Pallos, Laszlo; Kovacs, Jeno; and Magyar, Karoly, 4,097,668, Cl. 542-418.000.

Mahlein, Hans; and Rauscher, Walter, to Siemens Aktiengesellschaft. Optical layer device with reflecting surface on collodion foil. 4,097,126, Cl. 350-295.000.

Maillet, Alfred Marie Aime, to Carel Fouche Languepin. Method and apparatus for electrical machining. 4,097,710, Cl. 219-69.00D.

Mailliet, Pierre, to S. A. des Anciens Etablissements Paul Worth. Drilling machine for blast furnace tapholes. 4,097,033, Cl. 266-271.000.

Mainzer, Franz: *See—*
Niermann, Hermann; and Mainzer, Franz, 4,097,583, Cl. 423-303.000.

Majima, Kanji: *See—*
Tsuto, Keiichi; Majima, Kanji; and Imamura, Shigeyasu, 4,097,242, Cl. 23-283.000.

Makita, Masashi: *See—*
Kusakabe, Haruhiko; Makita, Masashi; and Ueda, Masutoshi, 4,096,890, Cl. 139-435.000.

Mallon, Richard G.: *See—*
Lewis, Arthur E.; and Mallon, Richard G., 4,096,912, Cl. 166-259.000.

Malloy, James Joseph, Jr.: *See—*
Hilton, Joseph James; and Malloy, James Joseph, Jr., 4,097,762, Cl. 313-218.000.

Mandl, Thomas Herbert. Phonetic teaching device. 4,096,645, Cl. 35-35.00R.

Manfuso, John A., Jr., to Burton, Parsons and Company, Inc. Method for cleaning soft hydrophilic gel contact lenses. 4,096,870, Cl. 134-28.000.

Manna, Robert E.: *See—*
Luperti, Harry E.; and Manna, Robert E., 4,097,145, Cl. 355-75.000.

Mannhardt, Annemarie; Eppe, Rudolf; and Pfeifer, Josef, to AGFA-Gevaert AG. Web with overlays for use in document presentation devices of copying machines and method of making the same. 4,097,280, Cl. 96-44.000.

Manoukian, Nubar Sahag; and Johnston, Thomas Frazier, Jr., to Coherent, Inc. Adjustable etalon laser mode selector and method of adjustment. 4,097,818, Cl. 331-94.50C.

Manufacturers Systems, Inc.: *See—*
Anderson, Leroy E.; Schmidt, Michael P.; and Weaver, William W., 4,096,720, Cl. 72-50.000.

Mar, Kenneth M.; Ritchie, Kim; and Smith, James N., to Motorola, Inc. Non-linear resistors. 4,097,834, Cl. 338-21.000.

Maran Corporation: *See—*
Noice, Frank M., 4,096,978, Cl. 224-8.00R.

Marathon Electric Manufacturing Company: *See—*
Motten, Roger Henwood, Jr., 4,097,114, Cl. 339-259.00F.

Maremont Corporation: *See—*
Gray, Alden J.; Sanderson, Ian S.; and Hardy, John C., 4,096,624, Cl. 29-596.000.

Marine Electric Corporation: *See—*
Parke, Harry George, 4,097,808, Cl. 325-51.000.

Marks, Tobin J.: *See—*
Coleman, John H.; and Marks, Tobin J., 4,097,384, Cl. 250-527.000.

Markusch, Peter, to Bayer Aktiengesellschaft. Inorganic-organic compositions. 4,097,422, Cl. 260-2.5AK.

Marr, Philip R., Sr.: *See—*
Peters, David L.; and Marr, Philip R., Sr., 4,097,154, Cl. 356-152.000.

Marsee, Frederick J., to Ethyl Corporation. Starting system. 4,096,843, Cl. 123-179.00A.

Marsh, Walter H. W., to Singer Company, The. Interlock for buttonhole sewing presser device. 4,096,811, Cl. 112-77.000.

Marshall Richards Barcro Limited: *See—*
Uhlmann, Otto; and Stephan, Norbert, 4,096,726, Cl. 72-291.000.

Martin, Charles S. Solar energy converting device. 4,096,698, Cl. 60-641.000.

Martin, Johannes Josef; and Weber, Erich, to Josef Martin Feuerungsbau GmbH. Apparatus for compensating for thermally induced deformation of sections of grates in industrial furnaces or the like. 4,096,809, Cl. 110-271.000.

Martin, John R. Register control method and apparatus. 4,096,801, Cl. 101-227.000.
Martin, Roger A., to Murdock Corporation, The. Electrical connector. 4,097,111, Cl. 339-183.000.
Martin, Van Clifton, to International Business Machines Corporation. Ink jet printer for selectively printing different resolutions. 4,097,873, Cl. 346-75.000.
Martin, Wayne A., to United States Steel Corporation. Forging press and method. 4,096,730, Cl. 72-352.000.
Martins, Joseph G.; and Donermeyer, Donald D., to Monsanto Company. Poly(ester-amide) hot melt adhesives containing spheroidal metal powders. 4,097,445, Cl. 260-40.00R.
Martorano, Sam, to Wilson Jones Company. Apparatus for stripping a continuous web of material from the marginal edge of a body. 4,096,981, Cl. 225-99.000.
Maruta, Rikio: *See—*
Araseki, Takashi; Ochiai, Kazuo; and Maruta, Rikio, 4,097,860, Cl. 340-347.0CC.
Maruyama, Noboru. Liquid heating apparatus. 4,096,851, Cl. 126-350.00R.
Marwil, Stanley J., to Phillips Petroleum Company. Fermentation apparatus. 4,097,339, Cl. 195-142.000.
Masak, Raymond J.: *See—*
Frost, William F.; Masak, Raymond J.; Baurle, Herbert F.; and Kowalski, Anthony F., 4,097,866, Cl. 343-100.0LE.
Maska, Rudolf: *See—*
Christenson, Roger M.; and Maska, Rudolf, 4,097,438, Cl. 260-29.4UA.
Mason, Russell I. Selected depth mooring system. 4,096,598, Cl. 9-8.00R.
Massa, Donald P., Trustees of The Stoneleigh Trust u/d/t: *See—*
Massa, Frank, 4,096,933, Cl. 194-100.00A.
Massa, Frank, to Dellorfano, Fred M., Jr.; and Massa, Donald P., Trustees of The Stoneleigh Trust u/d/t. Coin-operated vending systems. 4,096,933, Cl. 194-100.00A.
Masubuchi, Shoji: *See—*
Kitahara, Makoto; Ishikawa, Shozo; Katagiri, Kazuharu; Arita, Tetsuo; and Masubuchi, Shoji, 4,097,646, Cl. 428-323.000.
Masuda, Akira: *See—*
Norimatsu, Hideaki; Nakamura, Mitsuo; Kondo, Toshio; Masuda, Akira; and Kitajima, Sigenori, 4,096,834, Cl. 123-32.0EE.
Masuda, Hideo: *See—*
Morishima, Yukimas; Yoshida, Minoru; and Masuda, Hideo, 4,097,212, Cl. 425-313.000.
Matoba, Kazuo: *See—*
Kishida, Katsuhiro; Takao, Hiroshi; Togawa, Kimmochi; and Matoba, Kazuo, 4,097,353, Cl. 204-195.00S.
Matrix Groups, Inc.: *See—*
Goldstein, Morton I., 4,096,589, Cl. 2-12.000.
Matsuda, Itsuo: *See—*
Akiyama, Keiichi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujii, Takara, 4,097,545, Cl. 260-830.00P.
Matsui, Hiroshi: *See—*
Yui, Hiroshi; Kakizaki, Tetsuji; Sano, Hironari; Arai, Masakazu; and Matsui, Hiroshi, 4,097,554, Cl. 260-878.00R.
Matsui, Sadayoshi: *See—*
Koike, Wataro; Takayama, Masami; Ohashi, Hideaki; and Matsui, Sadayoshi, 4,097,426, Cl. 260-2.5AM.
Matsumoto, Shoichi; Kawamoto, Masahiro; and Mizunoya, Kiyoshi, to Tokyo Shibaura Electric Co., Ltd. Liquid crystal color display devices. 4,097,128, Cl. 350-335.000.
Matsuoka, Hideoki: *See—*
Ikawa, Kazuo; and Matsuoka, Hideoki, 4,097,064, Cl. 280-732.000.
Matsushita Electric Corporation: *See—*
Rzeszewski, Theodore S., 4,097,812, Cl. 328-138.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Kobayashi, Tetsu; Kanazawa, Takato; and Tsuboi, Makoto, 4,097,707, Cl. 219-10.55B.
Ochi, Yoshiaki, 4,097,688, Cl. 179-1.0GQ.
Yamada, Akitoshi; Goto, Toshiyuki; Kimura, Yoichi; and Kikuchi, Yoshinobu, 4,097,689, Cl. 179-1.00G.
Matsuura, Chihiro: *See—*
Tamura, Takaaki; Fujita, Norihiko; Matsuura, Chihiro; Ito, Wataru; and Negishi, Naoki, 4,097,576, Cl. 423-239.00A.
Matsuura, Kazuo: *See—*
Okada, Motohiro; Oka, Katsumi; Honda, Kiyoshi; and Matsuura, Kazuo, 4,097,065, Cl. 280-739.000.
Matsuzaki, Tokuo: *See—*
Umemura, Sumio; Ohdan, Kyoji; Uda, Taizo; Matsuzaki, Tokuo; Hidaka, Mikio; Nakamura, Yasuo; and Tsuruoka, Masao, 4,097,518, Cl. 260-465.300.
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. O-Alkyl-S-[1,6-dihydro-6-thioxo-pyridazin-(1)-yl methyl]-(thiono)-(di)-thiol-phosphoric (phosphonic) acid esters and ester-amides and nematicidal, insecticidal and acaricidal compositions thereof. 4,097,593, Cl. 424-200.000.
Maurer, Fritz: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,097,592, Cl. 424-200.000.
Mauritz, Wonter, to Schmelzbasaltwerk Kalenborn, Dr. Ing. Mauritz Kg. Forehearth with weir, particularly for use in a basalt smelting furnace. 4,097,032, Cl. 266-230.000.
Maximovich, Michael J.; and Burroway, Gary L., to Goodyear Tire & Rubber Company, The. Resin composition. 4,097,440, Cl. 260-31.40R.
Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, to Hoechst Aktiengesellschaft. 14-Substituted 7,15-diazadispiro-[5.1.5.3]-hexadecanes as UV stabilizers. 4,097,452, Cl. 260-45.80N.
Mayer, Richard Eugene: *See—*
Schwartz, Judd Leonard; and Mayer, Richard Eugene, 4,097,630, Cl. 428-97.000.
Mayes, David: *See—*
Golias, Tipton L.; and Mayes, David, 4,096,825, Cl. 118-221.000.
Mayo, Haydn Frank, to R. G. Dixon & Company Limited. Brush retention means for floor treating machines. 4,096,599, Cl. 15-49.00R.
Mazzeo, Nickolas Joseph; and Thompson, David A., to International Business Machines Corporation. Magnetoresistive field sensor with a magnetic shield which prevents sensor response at fields below saturation of the shield. 4,097,802, Cl. 324-252.000.
McAvity, Jack A.: *See—*
Cook, Herbert G.; and McAvity, Jack A., 4,096,946, Cl. 206-484.200.
McCaslin, Robert E. Rotatable light display. 4,097,917, Cl. 362-32.000.
McComb, Kenneth H.; and McComb, Timothy I., to Dorsey-McComb Distributors, Inc. Mechanism for adjusting an extrusion die in cereal grain extruder apparatus. 4,097,213, Cl. 425-376.00B.
McComb, Timothy I.: *See—*
McComb, Kenneth H.; and McComb, Timothy I., 4,097,213, Cl. 425-376.00B.
McCombs, Frank P.: *See—*
Foley, Kevin M.; Dewhurst, Harold A.; and McCombs, Frank P., 4,097,568, Cl. 264-216.000.
McConkey, Robert Charles: *See—*
Noonan, John Michael; McConkey, Robert Charles; and Hanrahan, Michael John, 4,097,282, Cl. 96-73.000.
McCrea, Charles Jeffrey: *See—*
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McDonald, Alan T., to PPG Industries, Inc. Method for producing slubbed yarns. 4,096,687, Cl. 57-157.00F.
McDonald, David Ian: *See—*
Kellermann, Arnold LeRoy; and McDonald, David Ian, 4,096,953, Cl. 214-1.0BT.
McEvoy Oilfield Equipment Company: *See—*
Morrill, Charles D., 4,097,069, Cl. 285-84.000.
McGraw-Edison Company: *See—*
Lapp, John; and Sadler, Fred S., 4,097,912, Cl. 361-318.000.
Lapp, John; and Sadler, Fred S., 4,097,913, Cl. 361-318.000.
McIntyre, Vernon E., to Wadsworth Equipment Company. Mounting bracket assembly. 4,097,012, Cl. 248-23.000.
McKelvy, Stephen L., to Physio-Control Corporation. Electrical connectors for portable electronic physiological instruments having separable first and second components. 4,097,113, Cl. 339-256.00R.
McKinney, Joel Drexler; Sebulsky, Raynor T.; and Wynne, Francis Edmund, Jr., to Gulf Research & Development Company. Method for enhancing distillate liquid yield from an ethylene cracking process. 4,097,362, Cl. 208-78.000.
McKinney, Joel Drexler; Sebulsky, Raynor T.; and Wynne, Francis Edmund, Jr., to Gulf Research & Development Company. Thermal cracking of light gas oil at high severity to ethylene. 4,097,363, Cl. 208-78.000.
McKnight, William B.: *See—*
Fagan, James J.; Otto, William F.; and McKnight, William B., 4,097,007, Cl. 244-3.110.
McLaughlin, Daniel John: *See—*
Gibbons, John Francis; and McLaughlin, Daniel John, 4,097,332, Cl. 176-87.000.
McLaughlin, Henry Felton. Drag implement for gathering and spreading dirt. 4,096,654, Cl. 37-118.00R.
McLaughlin, William A.; and Richardson, Edwin A., to Shell Oil Company. Acidizing asphaltenic oil reservoirs with acids containing salicylic acid. 4,096,914, Cl. 166-307.000.
McLaughlin, William F. Dual flow encatheter. 4,096,860, Cl. 128-214.400.
McMickle, John F., Jr., to Cozzoli Machine Company. Ampoule filling and sealing machine. 4,096,683, Cl. 53-244.000.
McMillan, Lon M. Navigational computer. 4,096,635, Cl. 33-98.000.
McNab, Incorporated: *See—*
Diamond, Joseph M., 4,096,743, Cl. 73-136.00A.
McNaney, Joseph T. Light optic data handling system. 4,097,122, Cl. 350-353.000.
McNaney, Joseph T. Light beam position control system. 4,097,123, Cl. 350-353.000.
Mead Corporation, The: *See—*
Davis, Gerald Titus; and Shackle, Dale Richard, 4,097,619, Cl. 427-44.000.
Wood, Prentice J., 4,096,985, Cl. 229-40.000.
Meagher, Thomas: *See—*
Hauser, Oscar G.; Meagher, Thomas; and Ruckdeschel, Frederick R., 4,097,139, Cl. 355-4.000.
Medalert Corporation: *See—*
Auerbach, Albert A.; and Steinberg, Sidney, 4,096,865, Cl. 128-419.0PT.
Megumi, Takeaki; and Kondo, Shigeo, to Mitsubishi Gas Chemical Company, Inc. Process for preparing high molecular weight polycarbonates. 4,097,457, Cl. 260-47.0XA.
Meiller, Hermann, to Willibald Grammer. Arm rest assembly for a seat, particularly a driver's seat. 4,097,088, Cl. 297-217.000.

Melbard, Sergei Nikolaevich: *See—*
Shergov, Igor Vladimirovich; and Melbard, Sergei Nikolaevich, 4,097,714, Cl. 219-121.0EB.
Melroe Industries, Inc.: *See—*
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Melton, Rosser B., Jr.; and Hubbard, Elbert M., to Southwest Research Institute. System for injecting particulate material into the combustion chamber of a repetitive combustion coating apparatus. 4,096,945, Cl. 206-469.000.
Menssen, Leroy K., to Raymond Lee Organization, Inc., The, a part interest. Camping utility stand. 4,096,951, Cl. 211-207.000.
Merck & Co., Inc.: *See—*
Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., 4,097,504, Cl. 260-405.000.
Reinhold, Donald F., 4,097,490, Cl. 260-326.450.
Merkle, F. Henry: *See—*
Chavkin, Leonard; and Merkle, F. Henry, 4,097,606, Cl. 424-324.000.
Merkle, Hans; and Mueller, Albrecht, to BASF Aktiengesellschaft. Manufacture of amidosulfonic acids. 4,097,521, Cl. 260-513.600.
Merle, Gerard: *See—*
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan Martinov; Pascault, Jean-Pierre; Pham, Quang Tho; Pillot, Christian; and Salle, Robert, 4,097,660, Cl. 526-173.000.
Mesecar, Roderick S.: *See—*
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Mesne Koh-I-Noor Rapidograph, Inc.: *See—*
Anderka, Gerold; Hampel, Horst; Jozat, Walter; and Straszewski, Klaus, 4,097,874, Cl. 346-140.00R.
Messerly, James W.; and Shipman, James J., to B.F. Goodrich Company, The. Internal tire lubricant. 4,096,898, Cl. 152-330.00L.
Messerschmitt-Boelkow-Blohm GmbH: *See—*
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Cramer, Rudolf; and Hildebrandt, Juergen J., 4,096,857, Cl. 128-84.00R.
Messner, Daryle: *See—*
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Metallgesellschaft Aktiengesellschaft: *See—*
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Stonner, Hans-Martin; and Wiesner, Paul, 4,097,539, Cl. 568-751.000.
Meto International GmbH: *See—*
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Mettler Instrumente AG: *See—*
Bartels, Hermann; Gallati, Fritz; Lang, Karl; and Rutishauser, Heinz, 4,096,972, Cl. 222-135.000.
Metz, Gunter: *See—*
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Meyer, Karl-Heinrich: *See—*
Burkhardt, Claus; Meyer, Karl-Heinrich; and Weirauch, Kurt, 4,097,455, Cl. 260-47.0CB.
Michel, Jean, to Swiss Aluminium Ltd. Device and process for limiting surface oxidation of glowing hot metal dross. 4,097,027, Cl. 266-44.000.
Michelman, David L.: *See—*
Michelman, Lionel S.; Michelman, Samuel M.; Michelman, David L.; and Michelman, Milton, 4,096,718, Cl. 70-63.000.
Michelman Iron Works Corp.: *See—*
Michelman, Lionel S.; Michelman, Samuel M.; Michelman, David L.; and Michelman, Milton, 4,096,718, Cl. 70-63.000.
Michelman, Lionel S.; Michelman, Samuel M.; Michelman, David L.; and Michelman, Milton, to Michelman Iron Works Corp. Tamper-proof locking device. 4,096,718, Cl. 70-63.000.
Michelman, Milton: *See—*
Michelman, Lionel S.; Michelman, Samuel M.; Michelman, David L.; and Michelman, Milton, 4,096,718, Cl. 70-63.000.
Michelman, Samuel M.: *See—*
Michelman, Lionel S.; Michelman, Samuel M.; Michelman, David L.; and Michelman, Milton, 4,096,718, Cl. 70-63.000.
Microdot Inc.: *See—*
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Mikes, Otakar; Strop, Petr; and Coupek, Jiri, to Ceskoslovenska akademie ved. Method for preparation of macroporous amphoteric ion exchangers with highly crosslinked hydrophilic polymeric matrix. 4,097,420, Cl. 260-2.10R.
Miki, Tosaku; Hosokawa, Yasuhiro; Miwa, Tamotsu; Fujita, Hiroshi; Asano, Masahide; and Aibara, Shunzo, to Daiichi Seiyaku Co., Ltd. Anti-ulcerous tyrosine derivatives. 4,097,608, Cl. 424-324.000.
Milberger, Ernest C.: *See—*
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Miles, Edward L. Orbital pump with inlet and outlet through the rotor. 4,097,205, Cl. 418-61.00R.
Miles Laboratories, Inc.: *See—*
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Leipzig, Theodore J., 4,097,479, Cl. 544-366.000.
Millar, John M., to Beatrice Foods Co. Flamboyant finish and process for applying same. 4,097,639, Cl. 428-215.000.
Miller, Albert J., to Engineering Systems Corporation. Local event broadcast system. 4,097,809, Cl. 325-54.000.
Miller, Mason D. Board game apparatus. 4,097,050, Cl. 273-243.000.
Miller, Merrell Thomas: *See—*
Hall, Walter Dennis; Miller, Merrell Thomas; and Roof, Douglas L., 4,096,772, Cl. 82-82.000.
Miller, Richard S.: *See—*
Schnur, Joel M.; Miller, Richard S.; Sheridan, James P.; and Britt, A. D., 4,097,317, Cl. 149-7.000.
Mills, William R., Jr., to Mobil Oil Corporation. Epithermal die-away porosity logging. 4,097,737, Cl. 250-269.000.
Milner, Edward F. G.: *See—*
Swinkels, Godefridus M.; Milner, Edward F. G.; and Genik-Sas-Berezowsky, Roman Michael, 4,097,271, Cl. 75-104.000.
Milwaukee Resistor Corporation: *See—*
Francis, Ralph M., Jr., 4,097,853, Cl. 340-258.00A.
Minard, Frederick Nelson: *See—*
Horrom, Bruce Wayne; Minard, Frederick Nelson; and Zaugg, Harold Elmer, 4,097,597, Cl. 424-250.000.
Miner, Mark S.; and Crickman, Charles W., to United States of America, Army. Air target fuze decision circuit. 4,096,805, Cl. 102-214.000.
Miniere, Jack K. Baseball batting training apparatus. 4,097,044, Cl. 273-26.00R.
Minkkinen, Ari A., to Lummus Company, The. Hydrotreating of pyrolysis gasoline. 4,097,370, Cl. 208-255.000.
Minnesota Mining and Manufacturing Company: *See—*
Bergh, Eugene H., 4,097,634, Cl. 428-156.000.
Watts, Ronald E., 4,097,405, Cl. 252-316.000.
Minogue, Robert W.; and Troyer, Lloyd E., to Let-R-Edge of Canada, Ltd. Product for constructing three-dimensional sign character. 4,097,632, Cl. 428-130.000.
Mirchev, Mircho Georgiev: *See—*
Sendov, Stoyan Hristov; Kuklin, Ivan Alexandrov; Nikolov, Ivan Angelov; Ivanov, Assen Ninov; Mirchev, Mircho Georgiev; and Kurtashev, Radoslav Borissov, 4,097,927, Cl. 366-247.000.
Mitaka, Shunji: *See—*
Hanakata, Takayoshi; and Mitaka, Shunji, 4,096,935, Cl. 400-479.000.
Mitchell, Allen L., to Hill, Paul David. Stove. 4,096,847, Cl. 126-61.000.
Mitsubishi Chemical Industries Limited: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,097,472, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,097,591, Cl. 424-177.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Endo, Hiroshi; and Ban, Kazuhiro, 4,097,864, Cl. 343-7.0VM.
Mitsubishi Gas Chemical Company, Inc.: *See—*
Megumi, Takeaki; and Kondo, Shigeo, 4,097,457, Cl. 260-47.0XA.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,096,692, Cl. 60-307.000.
Mitsubishi Paper Mills, Ltd.: *See—*
Tanaka, Akira; and Yoshida, Akio, 4,097,285, Cl. 96-132.000.
Mitsubishi Petrochemical Company Limited: *See—*
Tanaka, Tsunemitsu; Nakagawa, Tetsuo; Abiko, Shiro; and Kaneko, Norio, 4,097,366, Cl. 208-127.000.
Yui, Hiroshi; Kakizaki, Tetsuji; Sano, Hironari; Arai, Masakazu; and Matsui, Hiroshi, 4,097,554, Cl. 260-878.00R.
Mitsuboshi Belting Ltd.: *See—*
Shirasaka, Kaname; Nakagami, Yoshihiro; Tomiyori, Takashi; Ikemoto, Masanori; and Shaura, Tsuneo, 4,097,621, Cl. 427-173.000.
Mitsuhashi, James M.: *See—*
Bertin, Michael C.; Hicksted, Richard L.; and Mitsuhashi, James M., 4,097,566, Cl. 264-40.700.
Miwa, Tamotsu: *See—*
Miki, Tosaku; Hosokawa, Yasuhiro; Miwa, Tamotsu; Fujita, Hiroshi; Asano, Masahide; and Aibara, Shunzo, 4,097,608, Cl. 424-324.000.
Miyabe, Yoshio: *See—*
Toyoda, Takashi; Miyabe, Yoshio; and Yamanaka, Masaaki, 4,097,645, Cl. 428-306.000.
Miyakawa, Nobuaki, to Hitachi, Ltd. Apparatus for selectively displaying analogue quantities of plural input data signals. 4,097,857, Cl. 340-324.00R.
Miyakawa, Takeo: *See—*
Murayama, Takao; Shimizu, Seiichi; and Miyakawa, Takeo, 4,097,251, Cl. 55-97.000.
Miyao, Takayuki, to Aisin Seiki Kabushiki Kaisha. Hydro-mechanical transmission. 4,096,768, Cl. 74-865.000.
Miyata, Katsuhiko: *See—*
Uno, Naoyuki; and Miyata, Katsuhiko, 4,097,876, Cl. 354-31.000.
Miyazaki, Masami, to Toa Electric Company, Ltd. Time-division telephone system embodying trunks having demodulating-adder circuits. 4,097,694, Cl. 179-15.0AT.
Mizunoya, Kiyoshi: *See—*
Matsumoto, Shoichi; Kawamoto, Masahiro; and Mizunoya, Kiyoshi, 4,097,128, Cl. 350-335.000.
Mizutani, Hiroshi; Tamura, Masaru; and Saegusa, Katsumi, to Kao Soap Co., Ltd. Dry cleaning detergent composition. 4,097,397, Cl. 252-153.000.

Mobay Chemical Corporation: *See—*
Cleveland, Thomas H.; and Bailey, John V., 4,097,547, Cl. 260-860.000.
Rawlings, Herbert L.; and Baron, Arthur L., 4,097,435, Cl. 260-28.00R.

Mobil Oil Corporation: *See—*
Andress, Harry J., Jr., 4,097,389, Cl. 252-51.50A.
Florian, John, 4,096,986, Cl. 229-44.00R.
Haag, Werner O.; and Huang, Tracy J., 4,097,367, Cl. 208-135.000.
Haag, Werner O.; and Olson, David H., 4,097,543, Cl. 260-672.00T.
Mills, William R., Jr., 4,097,737, Cl. 250-269.000.
Womack, John W., 4,097,218, Cl. 431-76.000.

Mochizuki, Hiroshi: *See—*
Tanaka, Eizi; Ohashi, Michihiro; Mochizuki, Hiroshi; and Nishimatsu, Akira, 4,096,838, Cl. 123-139.0AW.

Moisture Systems Corp.: *See—*
Carlson, Roger E., 4,097,743, Cl. 250-339.000.

Molitor, Arvid A., to Luhring Chicago Industries. Hydrocyclone separator. 4,097,375, Cl. 210-23.00H.

Momparler, Fred J.: *See—*
Wilson, Michael A.; Momparler, Fred J.; and Coleman, Kenneth, 4,097,769, Cl. 307-252.00B.

Moncrieff-Yeates, Alexander John. Fireplace unit with sloping bed plate. 4,096,849, Cl. 126-121.000.

Monier Colourtile Pty. Ltd.: *See—*
Aarons, Raymond Joseph, 4,096,671, Cl. 52-94.000.

Monitron Industries: *See—*
Genest, Leonard J.; and Messner, Daryle, 4,097,728, Cl. 235-439.000.

Monro, David Jan, to USM Corporation. Adjustable and floating boring bar stabilizer. 4,096,771, Cl. 82-35.000.

Monsanto Company: *See—*
Barker, Robert I.; and King, David P., 4,096,739, Cl. 73-56.000.
Culbertson, Harry M., 4,097,463, Cl. 260-57.00A.
D'Amico, John J., 4,097,260, Cl. 71-94.000.
Deets, Gary L.; and Shapras, Peter, 4,097,552, Cl. 260-876.00R.
Hirsch, Richard H., 4,097,534, Cl. 260-609.00F.
Kruse, Robert L., 4,097,549, Cl. 260-876.00R.
Lewis, Charles, Jr.; and Schuck, James M., 4,097,473, Cl. 260-122.000.
Martins, Joseph G.; and Donermeyer, Donald D., 4,097,445, Cl. 260-40.00R.
Moran, James R., 4,097,555, Cl. 260-880.00R.

Montedison S.p.A.: *See—*
Balducci, Luigi; Sarti, Dino; and Gerelli, Fausto, 4,097,300, Cl. 106-299.000.

Monvoisin, Jacques, to Thomson-CSF. X-ray apparatus especially for mammography. 4,097,748, Cl. 250-505.000.

Moon, Malcolm W.; and Kornis, Gabriel, to Upjohn Company, The. Phenyl pyrazole thioamides. 4,097,672, Cl. 548-377.000.

Moore, James O., to Moore Products Co. Pressure to electric transducer. 4,096,758, Cl. 73-718.000.

Moore Products Co.: *See—*
Moore, James O., 4,096,758, Cl. 73-718.000.

Moore, William Percy, Jr., to Waverly Chemical Co. Process for stabilized high strength urea-aldehyde polymers. 4,097,419, Cl. 260-2.50F.

Moran, James R., to Monsanto Company. Transparent polymeric polyblend. 4,097,555, Cl. 260-880.00R.

Morge, Michael P.: *See—*
Adams, Stanley B.; Loebbaka, Gregory A.; and Morge, Michael P., 4,096,878, Cl. 137-351.000.

Mori, Yasuki: *See—*
Nara, Takashi; Okachi, Ryo; Yamamoto, Mitsuyoshi; Mori, Yasuki; Sato, Moriyuki; Sugimoto, Masahiro; and Shimizu, Yoshiaki, 4,097,428, Cl. 260-345.90R.
Tomioka, Shinji; and Mori, Yasuki, 4,097,664, Cl. 536-17.000.

Morishima, Yukimas; Yoshida, Minoru; and Masuda, Hideo, to Japan Steel Works, Ltd., The. Pelletizer. 4,097,212, Cl. 425-313.000.

Morita Iron Works Co., Ltd.: *See—*
Suzuki, Katsuyasu; Morita, Yoshitoshi; and Morita, Motoo, 4,096,891, Cl. 140-1.000.

Morita, Motoo: *See—*
Suzuki, Katsuyasu; Morita, Yoshitoshi; and Morita, Motoo, 4,096,891, Cl. 140-1.000.

Morita, Yoshitoshi: *See—*
Suzuki, Katsuyasu; Morita, Yoshitoshi; and Morita, Motoo, 4,096,891, Cl. 140-1.000.

Morreale, Anthony P., to Rapidsyn Co. Method for interconnecting stator coils. 4,096,625, Cl. 29-596.000.

Morrill, Charles D., to McEvoy Oilfield Equipment Company. Marine riser connector. 4,097,069, Cl. 285-84.000.

Morris, Albert G.: *See—*
Bain, George W., Jr.; Forgue, Stanley V.; and Morris, Albert G., 4,097,775, Cl. 313-388.000.

Morris, Edwin Earl, to General Electric Company. Automatic boost control in an aperture corrector for TV video signals. 4,097,897, Cl. 358-162.000.

Morris, Raymond A.; and Viola, Thomas J., Jr., to Hewlett-Packard Company. Low parasitic capacitance and resistance beamlead semiconductor component and method of manufacture. 4,097,890, Cl. 357-55.000.

Morrison, Ronald L.; and Dawson, John W. Process for making fishbait and the product produced thereby. 4,097,610, Cl. 426-1.000.

Morrow, George W. Minnow bait kit. 4,096,657, Cl. 43-56.000.

Morse, Milton. Synthetic resinous nesting cup construction. 4,096,947, Cl. 206-519.000.

Morton, George A.: *See—*
Ruedy, John E.; and Morton, George A., 4,097,761, Cl. 313-94.000.

Morton-Norwich Products, Inc.: *See—*
Pelosi, Stanford S., Jr., 4,097,499, Cl. 260-347.700.
Pelosi, Stanford S., Jr., 4,097,500, Cl. 260-347.700.

Moschovis, Elias P.; and Gilson, John L., to A. B. Dick Company. Liquid developer for electrophotographic offset masters. 4,097,391, Cl. 252-62.10L.

Moshier, Gary S., to American Can Company. Ultrasonic leak hole detection apparatus and method. 4,096,736, Cl. 73-40.000.

Mosier, Benjamin: *See—*
Posey, Dan E.; and Mosier, Benjamin, 4,097,395, Cl. 252-106.000.

Moskalik, James M., to Gulf & Western Manufacturing Company. Press slide adjusting and overload protection assembly. 4,096,798, Cl. 100-53.000.

Motorola, Inc.: *See—*
Carter, Ernest Aubert, 4,097,772, Cl. 307-279.000.
Ehrlich, Stephen Jeffrey; and Beyer, Edward Robert, 4,097,691, Cl. 179-2.00C.
Mar, Kenneth M.; Ritchie, Kim; and Smith, James N., 4,097,834, Cl. 338-21.000.

Motten, Roger Henwood, Jr., to Marathon Electric Manufacturing Company. Fuse holder with separate reject spring. 4,097,114, Cl. 339-259.00F.

Motz, Kaye L.: *See—*
Yang, Kang; Motz, Kaye L.; and Reedy, James D., 4,097,535, Cl. 260-603.00C.

Moulin, Jean-Claude; Escher, Balint; and Prince, Dominique, to Societe Lignes Telegraphiques et Telephoniques. Production of improved anodes for solid electrolyte capacitors. 4,097,415, Cl. 252-512.000.

Moulin, Michel; and Munier, Bernard, to Thomson-CSF. Electroacoustic device for reading a two dimensional image by means of an electrode network. 4,097,900, Cl. 358-213.000.

Moutou, Paul Cyril; Hareng, Michel; and Le Berre, Serge, to Thomson-CSF. Optical pattern tracer. 4,097,142, Cl. 355-45.000.

Moyer, Norman E., to Hughes Aircraft Company. Output circuit for a digital correlator. 4,097,844, Cl. 340-146.200.

Muanyagipari Kutato Intezet: *See—*
Simon, Artur; Sarosi, Gyula; Keszler, Balazs; Toth, Attila; and Rethy, Maria, 4,097,658, Cl. 526-143.000.

Mubir AG fur Maschinen-und Apparatebau: *See—*
Muller, Werner, 4,097,023, Cl. 254-156.000.

Muchowski, Joseph Martin; and Kluge, Arthur Frederick, to Syntex (U.S.A.) Inc. 5-(2-Pyrroyl)-1,2-dihydro-3H-pyrrolo[1,2-a]pyrrole-1-carboxylic acid derivatives and process for the production thereof. 4,097,579, Cl. 424-274.000.

Mueller, Albrecht: *See—*
Merkle, Hans; and Mueller, Albrecht, 4,097,521, Cl. 260-513.600.

Muelier, Rudolf: *See—*
Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,097,334, Cl. 195-51.00G.

Mullay, John J., to Atlas Powder Company. Method for gelling nitroparaffins in explosive compositions. 4,097,316, Cl. 149-2.000.

Muller, Alain, to Compagnie Francaise de Raffinage. Catalyst carriers and a process for their preparation. 4,097,412, Cl. 252-465.000.

Muller, Frank Andrew; and Peper, Henry, Jr., to Gillette Company, The. Ball-point instruments writing with improved transitorially erasable trace and ink compositions therefor. 4,097,290, Cl. 106-30.000.

Muller, Gerald: *See—*
Gladenbeck, Jurgen; Muller, Gerald; Schorken, Karl; and Schwindenhammer, Hans-Peter, 4,097,686, Cl. 174-131.00A.

Muller, Karl-Heinz; Rauch, Moriz V.; Krisch, Burkhard; and Veneklasen, Lee H., to Siemens Aktiengesellschaft. Beam deflection and focusing system for a scanning corpuscular-beam microscope. 4,097,739, Cl. 250-311.000.

Muller, Karl-Heinz; Schliepe, Reinhard; and Rindfleisch, Volker, to Siemens Aktiengesellschaft. Method and apparatus for focusing the objective lens of a scanning transmission-type corpuscular-beam microscope. 4,097,740, Cl. 250-311.000.

Muller, Werner, to Mubir AG fur Maschinen-und Apparatebau. Rope clamping arrangements for sailboats or other applications. 4,097,023, Cl. 254-156.000.

Mullins, Rex, to Coal Industry (Patents) Limited. Mine equipment. 4,096,753, Cl. 73-432.00R.

Munier, Bernard: *See—*
Moulin, Michel; and Munier, Bernard, 4,097,900, Cl. 358-213.000.

Murakami, Masuo; Takahashi, Kozo; Hirata, Yasufumi; Takashima, Mutsuo; Iwanami, Sumio; Hasegawa, Osamu; Nozaki, Yoshihisa; Tachikawa, Shiro; Takeda, Masaaki; and Usuda, Shinji, to Yamanouchi Pharmaceutical Co., Ltd. Pyrrolidinyl and piperidinyl benzamide derivatives. 4,097,487, Cl. 260-326.850.

Muramatsu, Tateo; Fukai, Toshio; and Takahashi, Haruo, to Bridgestone Tire Co., Ltd. Oil boom for damming and collecting a floating oil slick. 4,096,700, Cl. 61-1.00F.

Murayama, Seiichi: *See—*
Koizumi, Hideaki; Arai, Yoji; and Murayama, Seiichi, 4,097,781, Cl. 315-176.000.

Murayama, Takao; Shimizu, Seiichi; and Miyakawa, Takeo, to Taisei Kensetsu Kabushiki Kaisha & Tokyo Gas Co., Ltd. Method of filtering a sticky material-containing exhaust gas. 4,097,251, Cl. 55-97.000.

Murdock Corporation, The: *See—*
Martin, Roger A., 4,097,111, Cl. 339-183.000.

Musolf, Thomas Carl; and Wyman, Harold Thomas, to BASF Wyan-

... rporation. Flexing device for testing resilient articles and method of compression testing. 4,096,742, Cl. 73-94.000.

Myers, John L., to Ledex, Inc. Electromagnetic actuator. 4,097,833, Cl. 335-261.000.

N L Industries, Inc.: *See*—
Rao, Mannige Vikram; Coyle, Bernard H., Jr.; and Gallagher, Peter C. J., 4,097,270, Cl. 75-68.00R.

N. V. Industrieele Handelscombinatie Holland: *See*—
van Heijst, Willem Jan, 4,097,072, Cl. 285-114.000.

N. V. Optische Industrie "De Oude Delft": *See*—
Geluk, Ronald Jan, 4,097,898, Cl. 358-163.000.

Nadj, Henriette: *See*—
Pierre, Kenneth J.; Tung, Ker-Kong; and Nadj, Henriette, 4,097,336, Cl. 195-99.000.

Nagao, Shozo; Iwamatsu, Junkichi; Kitsukawa, Hiroshi; Nishizaki, Kozo; Watanabe, Yuichi; and Okamoto, Yasunori, to Kubota, Ltd. Pipe joint construction. 4,097,074, Cl. 285-231.000.

Nakagami, Tatsuro: *See*—
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,096,692, Cl. 60-307.000.

Nakagami, Yoshihiro: *See*—
Shira-aka, Kaname; Nakagami, Yoshihiro; Tomiyori, Takashi; Ikemoto, Masanori; and Shaura, Tsuneo, 4,097,621, Cl. 427-173.000.

Nakagawa, Junichi: *See*—
Ishizuka, Kohei; Kita, Yasuhiro; Takasaki, Yoshitaka; and Nakagawa, Junichi, 4,097,824, Cl. 333-28.00R.

Nakagawa, Kenji: *See*—
Horikawa, Susumu; Nakagawa, Kenji; and Nogami, Yoshito, 4,097,258, Cl. 65-31.000.

Nakagawa, Tetsuo: *See*—
Tanaka, Tsunemitsu; Nakagawa, Tetsuo; Abiko, Shiro; and Kaneko, Norio, 4,097,366, Cl. 208-127.000.

Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, to Kokusai Denshin Denwa Kabushiki Kaisha. Facsimile signal coding system. 4,097,903, Cl. 358-261.000.

Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Air-pump system for reciprocating engines. 4,096,692, Cl. 60-307.000.

Nakamura, Masayuki; and Sanuki, Setsuo, to Sumitomo Durez Company, Ltd. Method for manufacturing foundry molds. 4,097,443, Cl. 260-38.000.

Nakamura, Mitsuo: *See*—
Norimatsu, Hideaki; Nakamura, Mitsuo; Kondo, Toshio; Masuda, Akira; and Kitajima, Sigenori, 4,096,834, Cl. 123-32.0EE.

Nakamura, Yasuo: *See*—
Umemura, Sumio; Ohdan, Kyoji; Uda, Taizo; Matsuzaki, Tokuo; Hidaka, Mikio; Nakamura, Yasuo; and Tsuruoka, Masao, 4,097,518, Cl. 260-465.300.

Nakamuri, Makoto: *See*—
Shimokawa, Hayao; Nakamuri, Makoto; Ueno, Hideyo; Namiki, Isamu; and Shiina, Naonori, 4,097,319, Cl. 156-79.000.

Nakanishi, Atsuo: *See*—
Toyama, Kunio; Shimizu, Isamu; Imamura, Takeo; and Nakanishi, Atsuo, 4,097,556, Cl. 260-886.000.

Nakayama, Hirokazu: *See*—
Tsutsumi, Hisao; Hayashi, Shizuo; Nakayama, Hirokazu; and Ukena, Toshinao, 4,097,403, Cl. 252-312.000.

Nalco Chemical Company: *See*—
Aitken, Thomas; and Pote, Wilfred D., 4,097,427, Cl. 260-9.000.
Connors, Charles W., 4,097,019, Cl. 249-204.000.

Namikas, Daumantas; and Kuwabara, Takao, to Bechtel International Corporation; and Hitachi, Ltd. Method of and apparatus for controlling by-pass valve. 4,097,183, Cl. 415-1.000.

Namiki, Isamu: *See*—
Shimokawa, Hayao; Nakamuri, Makoto; Ueno, Hideyo; Namiki, Isamu; and Shiina, Naonori, 4,097,319, Cl. 156-79.000.

Nara, Takashi; Okachi, Ryo; Yamamoto, Mitsuyoshi; Mori, Yasuki; Sato, Moriyuki; Sugimoto, Masahiro; and Shimizu, Yoshiaki, to Abbott Laboratories. Fortimicin C and process for production thereof. 4,097,428, Cl. 260-345.90R.

National Distillers and Chemical Corporation: *See*—
Scheben, John A., 4,097,533, Cl. 260-599.000.

National Research Development Corporation: *See*—
Levine, Ronnie Stuart, 4,097,588, Cl. 424-52.000.

National Starch and Chemical Corporation: *See*—
Pastor, Stephen D.; Skoultchi, Martin M.; and Hernandez, Henry R., 4,097,350, Cl. 204-159.230.
Pastor, Stephen D.; Skoultchi, Martin M.; and Hernandez, Henry R., 4,097,417, Cl. 252-501.000.

Navarre, Irving: *See*—
Genuardi, Bennie, 4,097,191, Cl. 416-170.00R.

Naz, Paul. Self-compensating two-piece siding or roofing slat. 4,096,679, Cl. 52-551.000.

NECCHI Societa per Azioni: *See*—
Bianchi, Nereo, 4,096,810, Cl. 112-65.000.

Negishi, Naoki: *See*—
Sakai, Tomoya; and Negishi, Naoki, 4,097,541, Cl. 260-668.00R.
Tamura, Takaaki; Fujita, Norihiko; Matsuura, Chihiro; Ito, Wataru; and Negishi, Naoki, 4,097,576, Cl. 423-239.00A.

Negola, Edward J.; and Brown, Jerald, to Glen Head, Inc. Method and apparatus for treatment of yarn in package form. 4,097,232, Cl. 8-65.000.

Neil, Clyde Carl; Hammer, Jacob Meyer; and Bartolini, Robert Alfred, to RCA Corporation. Optical coupler having improved efficiency. 4,097,117, Cl. 350-96.170.

Neiman S.A.: *See*—
Lipschutz, Paul, 4,096,715, Cl. 70-59.000.

Neissel, John P.; Hendon, Harry H.; and Terhune, James H., to General Electric Company. Instrumentation assembly for nuclear reactor. 4,097,330, Cl. 176-19.00R.

Nelson, Arnold Eugene, to Harmon's Northern Mfg., Inc. Tractor. 4,097,085, Cl. 296-28.00C.

Nelson, Jack: *See*—
Richmond, Kenneth D.; Hartman, Russell E.; Rogers, Jerry W.; and Nelson, Jack, 4,096,764, Cl. 74-233.000.

Nelson, James K., to Fedders Corporation. Dryer door stop assembly. 4,096,602, Cl. 16-85.000.

Nelson, Norman A., to Upjohn Company, The. 2,3,5α-Trihydroxy-2-hydroxymethyl-1α-cyclopentane acetic acid 5γ -lactone derivatives. 4,097,493, Cl. 260-343.30P.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-11-deoxy-PGE_1 analogs. 4,097,529, Cl. 260-586.00R.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-$PGF_{1\alpha}$compounds. 4,097,537, Cl. 568-807.000.

Nemeth, Suzette B.; and Wilson, David W., to Avery International Corporation. Double faced tab fastener characterized by a strip of release agent designed to extend partly beyond the width of a strip of adhesive. 4,097,627, Cl. 428-40.000.

Nesher, Dan; and Zemer, Yigael. Educational aid. 4,096,644, Cl. 35-31.00R.

Netterstedt, Sture; and Lindstrand, Bengt, to Rostfria Tak Aktiebolag. Fastener for retaining sheet cladding. 4,096,681, Cl. 52-713.000.

Netto, Cassiano Mesquita: *See*—
Sanz Hernandez, Jose Antonio; and Netto, Cassiano Mesquita, 4,097,635, Cl. 428-172.000.

Neuhierl, Hermann. Toy model vehicle track support system. 4,096,658, Cl. 46-17.000.

Neumann, Helmut, to Rohm GmbH. Resin-impregnated self-adhering or heat-sealable papers and method of making. 4,097,649, Cl. 428-327.000.

Newell, Denis Alfred, to Alfred Herbert Limited. Diehead chaser carrier. 4,097,178, Cl. 408-151.000.

Next Generation Housing Corporation of America: *See*—
Howard, John R.; and Loomis, Robert W., 4,096,675, Cl. 52-79.100.

Ngo, Peter Dinh-Tuan, to Bell Telephone Laboratories, Incorporated. Method and apparatus for energizing the cells of a plasma display panel to selected brightness levels. 4,097,780, Cl. 315-169.0TV.

Nichols, James D.; and Quinn, Edwin J., to Armstrong Cork Company. Flame and smoke-suppressed vinyl chloride resin compositions. 4,097,432, Cl. 260-23.0XA.

Nicholson, Myron D.: *See*—
Johnson, Donald C.; and Nicholson, Myron D., 4,097,666, Cl. 536-57.000.

Nielsen, Jacob August, to Kosan Crisplant A/S. Selectively controllable unloading arrangement for sorting conveyor constructions. 4,096,936, Cl. 198-356.000.

Nielsen, Kaj: *See*—
Nygaard, Nils Hansson; Nielsen, Kaj; and Strandtoft, Benny, 4,097,788, Cl. 318-415.000.

Niermann, Hermann; and Mainzer, Franz, to Hoechst Aktiengesellschaft. Process for the production of phosphorus pentasulfide. 4,097,583, Cl. 423-303.000.

Niertit, Frank, to Stromberg-Carlson Corporation. Internal combustion engine air-fuel ratio control system utilizing oxygen sensor. 4,096,839, Cl. 123-139.0AW.

Niikura, Masakatsu, to Janome Sewing Machine Co. Ltd. Intermittent stitching device for sewing machines. 4,096,813, Cl. 112-275.000.

Nikolov, Ivan Angelov: *See*—
Sendov, Stoyan Hristov; Kuklin, Ivan Alexandrov; Nikolov, Ivan Angelov; Ivanov, Assen Ninov; Mirchev, Mircho Georgiev; and Kurtashev, Radoslav Borissov, 4,097,927, Cl. 366-247.000.

Nippi, Incorporated: *See*—
Sohde, Takeshi; Gotoh, Astuko; Iwamoto, Kuniharu; and Okamoto, Yasushi, 4,097,234, Cl. 8-94.190.

Nippon Electric Co., Ltd.: *See*—
Araseki, Takashi; Ochiai, Kazuo; and Maruta, Rikio, 4,097,860, Cl. 340-347.0CC.
Otani, Susumu; and Noguchi, Toshitake, 4,097,813, Cl. 329-104.000.
Yamaguchi, Masaru, 4,097,687, Cl. 178-68.000.

Nippon Kayaku Co., Ltd.: *See*—
Takahashi, Masaoki; and Fumishi, Michio, 4,097,233, Cl. 8-83.000.

Nippon Kogaku K.K.: *See*—
Kuroha, Noboru, 4,097,116, Cl. 350-86.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Higuchi, Kousaku; Sato, Satoshi; and Wada, Susumu, 4,097,031, Cl. 266-226.000.

Nippon Soken, Inc.: *See*—
Tanaka, Eizi; Ohashi, Michihiro; Mochizuki, Hiroshi; and Nishimatsu, Akira, 4,096,838, Cl. 123-139.0AW.

Nippondenso Co., Ltd.: *See*—
Nojiri, Tadao; and Sugiura, Akio, 4,096,992, Cl. 235-462.000.
Norimatsu, Hideaki; Nakamura, Mitsuo; Kondo, Toshio; Masuda, Akira; and Kitajima, Sigenori, 4,096,834, Cl. 123-32.0EE.
Yamawaki, Masao; Aoki, Katsuo; Oka, Yoshio; Suzuki, Takao; Ina, Osamu; and Hara, Kunihiko, 4,096,822, Cl. 118-48.000.

Nirenberg, Robert P. Self-contained garment treating apparatus. 4,096,714, Cl. 68-5.00C.

Nishijima, Akio: *See—*
Komatsu, Koei; Itoyama, Kenji; Hirota, Jun; and Nishijima, Akio, 4,097,661, Cl. 526-175.000.

Nishimatsu, Akira: *See—*
Tanaka, Eizi; Ohashi, Michihiro; Mochizuki, Hiroshi; and Nishimatsu, Akira, 4,096,838, Cl. 123-139.0AW.

Nishimura, Daikichi: *See—*
Ishida, Torao; Akiyama, Minoru; Nishimura, Daikichi; Hayashi, Hiroshi; Sakurai, Yoshio; and Tsukagoshi, Shigeru, 4,097,665, Cl. 536-23.000.

Nishiyama, Mitsuru, to Sharp Kabushiki Kaisha. Reflective type liquid crystal display. 4,097,131, Cl. 350-338.000.

Nishizaki, Kozo: *See—*
Nagao, Shozo; Iwamatsu, Junkichi; Kitsukawa, Hiroshi; Nishizaki, Kozo; Watanabe, Yuichi; and Okamoto, Yasunori, 4,097,074, Cl. 285-231.000.

Nissan Motor Company, Limited: *See—*
Endo, Hiroshi; and Ban, Kazuhiro, 4,097,864, Cl. 343-7.0VM.
Ikawa, Kazuo; and Matsuoka, Hideoki, 4,097,064, Cl. 280-732.000.
Kawamoto, Tamio, 4,096,693, Cl. 60-337.000.
Kishida, Katsuhiro; Takao, Hiroshi; Togawa, Kimmochi; and Matoba, Kazuo, 4,097,353, Cl. 204-195.00S.
Seki, Chichitada; and Furuhashi, Nobuo, 4,097,561, Cl. 261-41.00D.
Yuzawa, Haruo, 4,097,563, Cl. 261-121.00B.

Nixon, Donald H.: *See—*
Crawford, Daniel G.; James, Stanley E.; and Nixon, Donald H., 4,097,071, Cl. 285-94.000.

Niznik, George E., to General Electric Company. Thermoplastic formable blends, a foaming method and products made thereby. 4,097,425, Cl. 260-2.50N.

Niznik, George E., to General Electric Company. Dihydrooxadiazinones and method for making. 4,097,671, Cl. 544-66.000.

Noble, Leo E.: *See—*
Hullinger, Lee, Jr.; and Noble, Leo E., 4,097,811, Cl. 325-470.000.

Nogami, Yoshito: *See—*
Horikawa, Susumu; Nakagawa, Kenji; and Nogami, Yoshito, 4,097,258, Cl. 65-31.000.

Noguchi, Toshitake: *See—*
Otani, Susumu; and Noguchi, Toshitake, 4,097,813, Cl. 329-104.000.

Nohira, Hidetaka; Bessho, Hironori; and Sakai, Yasuyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Catalyst container for use in exhaust manifold. 4,096,691, Cl. 60-295.000.

Noice, Frank M., to Maran Corporation. Backpack. 4,096,978, Cl. 224-8.00R.

Nojiri, Tadao; and Sugiura, Akio, to Nippondenso Co., Ltd. System for recognizing bar code information. 4,096,992, Cl. 235-462.000.

Nolan, W. Paul. Anti-collision plotter. 4,096,633, Cl. 33-1.0SD.

Noland, Richard D. Baghouse with double pass traveling purge head. 4,097,254, Cl. 55-294.000.

Noonan, John Michael; McConkey, Robert Charles; and Hanrahan, Michael John, to Eastman Kodak Company. Anionic imino-containing polymeric adhesives for photographic materials. 4,097,282, Cl. 96-73.000.

Norimatsu, Hideaki; Nakamura, Mitsuo; Kondo, Toshio; Masuda, Akira; and Kitajima, Sigenori, to Nippondenso Co., Ltd. Air-to-fuel ratio feedback control system for internal combustion engines. 4,096,834, Cl. 123-32.0EE.

Norman, Tom. Smoking apparatus and methods of constructing and utilizing same. 4,096,868, Cl. 131-173.000.

Northern Telecom Limited: *See—*
Harman, Stephen George, 4,097,697, Cl. 179-175.30R.

Northwestern University: *See—*
Coleman, John H.; and Marks, Tobin J., 4,097,384, Cl. 250-527.000.

Nott, Alan J., to Anglo-American Clays Corporation. Method for improving clay brightness utilizing magnetic separation. 4,097,372, Cl. 209-3.000.

Novak, Ernest Richard, to Du Pont de Nemours, E. I., and Company. Acrylic graft copolymers blended with acrylic resins. 4,097,553, Cl. 260-876.00R.

Novak, Robert M.: *See—*
Hall, John B.; Sprecker, Mark A.; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; and Novak, Robert M., 4,097,416, Cl. 252-522.000.

Nozaki, Yoshihisa: *See—*
Murakami, Masuo; Takahashi, Kozo; Hirata, Yasufumi; Takashima, Mutsuo; Iwanami, Sumio; Hasegawa, Osamu; Nozaki, Yoshihisa; Tachikawa, Shiro; Takeda, Masaaki; and Usuda, Shinji, 4,097,487, Cl. 260-326.850.

Nucleonics Data Systems: *See—*
Bertin, Michael C.; Hicksted, Richard L.; and Mitsuhashi, James M., 4,097,566, Cl. 264-40.700.

Nussbaum, Gerald F. Combined well pump housing and aeration means. 4,097,201, Cl. 417-360.000.

Nygaard, Nils Hansson; Nielsen, Kaj; and Strandtoft, Benny, to Danfoss A/S. Control circuit for a self-starting electric motor. 4,097,788, Cl. 318-415.000.

Nyhuis, Robert J.; and Smith, Terrence F. Method and apparatus for polling security alarm installations. 4,097,696, Cl. 179-2.00A.

Nyi, Kayson: *See—*
Emmons, William D.; and Nyi, Kayson, 4,097,677, Cl. 560-220.000.

Oberhardt, Bruce J.; and Olich, Jack, to Technicon Instruments Corporation. Determination of cells in blood. 4,097,237, Cl. 23-230.00B.

Occidental Petroleum Corporation: *See—*
Sack, Stuart, 4,097,360, Cl. 208-8.000.

Ochi, Shikanosuke, to Kabushiki Kaisha Sega Enterprises. Device for kicking ball in a pinball game machine. 4,097,047, Cl. 273-127.00R.

Ochi, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. Stereophonic reproducing system. 4,097,688, Cl. 179-1.0GQ.

Ochiai, Kazuo: *See—*
Araseki, Takashi; Ochiai, Kazuo; and Maruta, Rikio, 4,097,860, Cl. 340-347.0CC.

O'Connor, John R.: *See—*
Goldberg, Robert M.; and O'Connor, John R., 4,097,051, Cl. 273-254.000.

Oesterreichische Salen-Kunststoffwerk Gesellschaft m.b.H.: *See—*
Wackenreuther, Helmut; and Svec, Alexander, 4,097,076, Cl. 285-340.000.

Ogihara, Masuo: *See—*
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; and Shinozaki, Nobuo, 4,097,755, Cl. 310-114.000.

Ohashi, Hideaki: *See—*
Koike, Wataro; Takayama, Masami; Ohashi, Hideaki; and Matsui, Sadayoshi, 4,097,426, Cl. 260-2.5AM.

Ohashi, Michihiro: *See—*
Tanaka, Eizi; Ohashi, Michihiro; Mochizuki, Hiroshi; and Nishimatsu, Akira, 4,096,838, Cl. 123-139.0AW.

Ohashi, Ryota: *See—*
Yano, Kazuhiko; Otsuki, Kazuhiko; and Ohashi, Ryota, 4,096,882, Cl. 137-596.120.

Ohdan, Kyoji: *See—*
Umemura, Sumio; Ohdan, Kyoji; Uda, Taizo; Matsuzaki, Tokuo; Hidaka, Mikio; Nakamura, Yasuo; and Tsuruoka, Masao, 4,097,518, Cl. 260-465.300.

O'Herlen, Charles R., to Raymond Lee Organization, Inc., The, a part interest. Rifle pellet casting mold. 4,097,018, Cl. 249-105.000.

Ohinouye, Tsuneo: *See—*
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,096,692, Cl. 60-307.000.

Ohkubo, Kazuo: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,097,472, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,097,591, Cl. 424-177.000.

Ohtani, Sumio; Hiratsuka, Nobuo; and Horiguchi, Masaru, to Fuji Photo Film Co., Ltd. Process for production of microporous sheet. 4,097,383, Cl. 210-500.00M.

Oil-Rite Corporation: *See—*
Lyden, Frank J., 4,096,924, Cl. 184-58.000.

Oji Yuka Goseishi Kabushiki Kaisha: *See—*
Toyoda, Takashi; Miyabe, Yoshio; and Yamanaka, Masaaki, 4,097,645, Cl. 428-306.000.

Oka, Katsumi: *See—*
Okada, Motohiro; Oka, Katsumi; Honda, Kiyoshi; and Matsuura, Kazuo, 4,097,065, Cl. 280-739.000.

Oka, Yoshio: *See—*
Yamawaki, Masao; Aoki, Katsuo; Oka, Yoshio; Suzuki, Takao; Ina, Osamu; and Hara, Kunihiko, 4,096,822, Cl. 118-48.000.

Okachi, Ryo: *See—*
Nara, Takashi; Okachi, Ryo; Yamamoto, Mitsuyoshi; Mori, Yasuki; Sato, Moriyuki; Sugimoto, Masahiro; and Shimizu, Yoshiaki, 4,097,428, Cl. 260-345.90R.

Okada, Motohiro; Oka, Katsumi; Honda, Kiyoshi; and Matsuura, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Safety air cushion bag in automotive vehicles. 4,097,065, Cl. 280-739.000.

Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-arylsulfonyl-l-argininamides and the pharmaceutically acceptable salts thereof. 4,097,472, Cl. 424-177.000.

Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-arylsulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,097,591, Cl. 424-177.000.

Okamoto, Yasunori: *See—*
Nagao, Shozo; Iwamatsu, Junkichi; Kitsukawa, Hiroshi; Nishizaki, Kozo; Watanabe, Yuichi; and Okamoto, Yasunori, 4,097,074, Cl. 285-231.000.

Okamoto, Yasushi: *See—*
Sohde, Takeshi; Gotoh, Astuko; Iwamoto, Kuniharu; and Okamoto, Yasushi, 4,097,234, Cl. 8-94.190.

Okazaki, Kunio, to Stanley Electric Co., Ltd. Switch mechanism for a turn signal. 4,097,700, Cl. 200-61.270.

Olander, Walter Karl, to General Electric Company. Process for making polyphenylene oxides. 4,097,462, Cl. 260-47.0ET.

Olich, Jack: *See—*
Oberhardt, Bruce J.; and Olich, Jack, 4,097,237, Cl. 23-230.00B.

Olin Corporation: *See—*
Scott, Robert N.; and Knowles, Thomas A., 4,097,406, Cl. 252-351.000.

Olschewski, Hans Joachim, to FKF Berlin Fleischwaren-und Konserven- Fabrik Schulz & Berndt GmbH and Co., KG. Method for sealing plastic-metal laminates. 4,097,318, Cl. 156-69.000.

Olsen, Carlton Edward; and Serpa, Leroy Jasper, to International Business Machines Corporation. Method of making multi-layer photosensitive glass ceramic charge plate. 4,096,626, Cl. 29-624.000.

Olsen, Gunnar Ernst Rudolf; Iversen, Poul Christian Carlos; and Birker, Bertel, to Danfoss A/S. Control system for charging and discharging an electric storage heater. 4,097,719, Cl. 219-364.000.

Olsen, Richard J., to Goodyear Tire & Rubber Company, The. Earthmover tire and rim assembly. 4,096,900, Cl. 152-354.00R.

Olson, David H.: *See—*
Haag, Werner O.; and Olson, David H., 4,097,543, Cl. 260-672.00T.

Olson, David Harmon; and Berg, Eldon Carl, to Tektronix, Inc. Oscilloscope sweep rate indicator system. 4,097,798, Cl. 324-78.00D.

Olson, Donald R.: *See—*
Lemmon, John C.; Olson, Donald R.; and Zepernick, Dean E., 4,096,880, Cl. 137-454.200.

Olson Manufacturing Company: *See—*
Olson, Norman R., 4,097,246, Cl. 51-309.00R.

Olson, Norman R., to Olson Manufacturing Company. Method of making an abrasive wire for sawing stone. 4,097,246, Cl. 51-309.00R.

Olympus Optical Co., Ltd.: *See—*
Saito, Shoichi, 4,097,006, Cl. 242-199.000.
Satoh, Ken; and Tomizawa, Yoshio, 4,097,726, Cl. 235-92.0MP.

Ongaro, Theodore. Hydraulic power system. 4,096,784, Cl. 91-6.000.

Optel Corporation: *See—*
Witzke, Horst, 4,097,655, Cl. 429-111.000.

Orofino, Michael J. Sanitary pickup device for animal feces. 4,097,082, Cl. 294-19.00R.

Oscar Mayer & Co. Inc.: *See—*
Seiferth, Oscar E.; and Royston, Calvin T., 4,097,611, Cl. 426-121.000.

Osro Limited: *See—*
Brown, David, 4,096,666, Cl. 51-7.000.

Ostergren, William F.: *See—*
Brackbill, Warren H.; and Ostergren, William F., 4,097,001, Cl. 239-658.000.

Otani, Susumu; and Noguchi, Toshitake, to Nippon Electric Co., Ltd. Carrier wave recovery circuit. 4,097,813, Cl. 329-104.000.

Ototani, Tohei; and Kataura, Yasuji, to Tohei Ototani. Method of treating molten ferrous material with composite rods containing Ca. 4,097,268, Cl. 75-57.000.

Otsuka, Katsumi; Ishigami, Noriakira; and Kozakai, Asao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Braking fluid pressure fault alarm device. 4,097,841, Cl. 340-52.00C.

Otsuki, Kazuhiko: *See—*
Yano, Kazuhiko; Otsuki, Kazuhiko; and Ohashi, Ryota, 4,096,882, Cl. 137-596.120.

Ott, Meredith S.: *See—*
Chiesa, Peter J., Jr.; and Ott, Meredith S., 4,097,305, Cl. 134-6.000.

Otto Fuchs KG.: *See—*
Diels, Manfred; Dienstuhl, Karl Wilhelm; Jager, Tilo; and Hocker, Eitel, 4,096,678, Cl. 52-403.000.

Otto, William F.: *See—*
Fagan, James J.; Otto, William F.; and McKnight, William B., 4,097,007, Cl. 244-3.110.

Otzen, Karl G., to Safety-Kleen Corporation. Immersion cleaner. 4,096,873, Cl. 134-135.000.

Outboard Marine Corporation: *See—*
Evinrude, Ralph S., 4,096,819, Cl. 115-17.000.
Hall, Charles B., 4,096,820, Cl. 115-41.0HT.

Over, William Roderick; and Wise, Joseph Agusta, to AMP Incorporated. Terminal housing having an integral strain relief. 4,097,106, Cl. 339-99.00R.

Owens-Corning Fiberglas Corporation: *See—*
Foley, Kevin M.; Dewhurst, Harold A.; and McCombs, Frank P., 4,097,568, Cl. 264-216.000.

Owens-Illinois, Inc.: *See—*
Davey, Richard G., 4,097,257, Cl. 65-26.000.
Dickson, Andrew C.; and Kontz, Robert F., 4,097,570, Cl. 264-296.000.
Kontz, Robert F., 4,096,620, Cl. 29-428.000.
Riggs, Darius O.; and Vogel, Charles G., 4,096,939, Cl. 198-460.000.

Oxford Hill, Ltd.: *See—*
Thiele, Geraldine H., 4,097,604, Cl. 424-318.000.

Oxford Laboratories Inc.: *See—*
Sturm, Ronald Leo, 4,096,750, Cl. 73-425.600.
Withers, Stanley J.; and Sturm, Ronald L., 4,096,751, Cl. 73-425.600.

Ozga, Stanley Edward, to RCA Corporation. Hardware control for repeating program loops in electronic computers. 4,097,920, Cl. 364-200.000.

Paananen, Eugene E.: *See—*
Krause, Thomas R.; Paananen, Eugene E.; and Burcz, John F., 4,097,731, Cl. 250-205.000.
Krause, Thomas R.; Paananen, Eugene E.; and Burcz, John F., 4,097,732, Cl. 250-205.000.

Pabst, Alton L., to Seaman Corporation. Membrane building segment connection. 4,096,669, Cl. 52-63.000.

Packer, Elliot L. Electrolytic recovery of metals. 4,097,347, Cl. 204-109.000.

Pagani, Giorgio; Guerreri, Gianfranco; and Peri, Bruno, to Snamprogetti, S.p.A. Method for the purification of natural gas having a high contents of acidic gases. 4,097,250, Cl. 55-48.000.

Pagel, Paul V., to Microdot Inc. Prestressed connection and fastener therefor. 4,097,168, Cl. 403-388.000.

Pallos, Ferenc M.: *See—*
Lam, Hsiao-Ling; and Pallos, Ferenc M., 4,097,512, Cl. 260-453.0RW.

Pallos, Laszlo: *See—*
Benko, Pal; Simonek, Ildiko; Pallos, Laszlo; Kovacs, Jeno; and Magyar, Karoly, 4,097,668, Cl. 542-418.000.

Palmer, Walter E., to General Motors Corporation. Variable displacement gear pump. 4,097,204, Cl. 418-19.000.

Panayotov, Ivan Martinov: *See—*
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan Martinov; Pascault, Jean-Pierre; Pham, Quang Tho; Pillot, Christian; and Salle, Robert, 4,097,660, Cl. 526-173.000.

Paniello, Antonio Ibanez: *See—*
Porta, Angel Lazaro; and Paniello, Antonio Ibanez, 4,097,528, Cl. 260-570.00R.

Papa, Anthony Joseph; and Runyan, Walter Warren, to Union Carbide Corporation. Chloroalkyl polyphosphates method for making same. 4,097,559, Cl. 260-928.000.

Papenfuhs, Theodor; and Troster, Helmut, to Hoechst Aktiengesellschaft. Perinone compounds as colorants for polyolefins. 4,097,450, Cl. 260-42.210.

Papenfuhs, Theodor; and Volk, Heinrich, to Hoechst Aktiengesellschaft. Water-insoluble nickel-complex disazo methine compounds. 4,097,510, Cl. 260-439.00R.

Papst-Motoren KG: *See—*
Doemen, Benno, 4,097,789, Cl. 318-461.000.

Pardo, Pierre; and Pruvot, Francois, to Sofermo. Self-contained modular joint, notably for robots. 4,096,766, Cl. 74-640.000.

Pariza, George R., to Pittway Corporation. D.C. horn. 4,097,861, Cl. 340-388.000.

Parke, Harry George, to Marine Electric Corporation. Entertainment system and method. 4,097,808, Cl. 325-51.000.

Parker, Duane L.: *See—*
Shelby, Robert L.; Duke, James T.; and Parker, Duane L., 4,097,093, Cl. 305-22.000.

Parks, Harold G., to General Electric Company. High resolution matrix lens electron optical system. 4,097,745, Cl. 250-398.000.

Parks, Robert R.: *See—*
Goodrich, Stanley R., Jr.; Skolnik, David J.; Stearns, Joseph A.; Farrell, Robert C.; Brezinski, Richard R.; and Parks, Robert R., 4,097,057, Cl. 280-96.100.

Parmann, Gunnar, to Rieber & Son A/S. Method for bending thermoplastic pipes. 4,097,573, Cl. 264-322.000.

Parrish, James Thomas: *See—*
Cook, Peter William; Parrish, James Thomas; and Schuster, Stanley Everett, 4,097,753, Cl. 307-359.000.

Pascault, Jean-Pierre: *See—*
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan Martinov; Pascault, Jean-Pierre; Pham, Quang Tho; Pillot, Christian; and Salle, Robert, 4,097,660, Cl. 526-173.000.

Pastor, Stephen D.; Skoultchi, Martin M.; and Hernandez, Henry R., to National Starch and Chemical Corporation. Actinic radiation curable compositions. 4,097,350, Cl. 204-159.230.

Pastor, Stephen D.; Skoultchi, Martin M.; and Hernandez, Henry R., to National Starch and Chemical Corporation. Photocurable electroconductive coating composition. 4,097,417, Cl. 252-501.000.

Patterson, Frank Knowles; and Rellick, Joseph Richard, to Du Pont de Nemours, E. I., and Company. Cobalt boride conductor compositions. 4,097,653, Cl. 428-433.000.

Patterson, Paul L., to Varian Associates, Inc. Two-flame burner for flame photometric detection. 4,097,239, Cl. 23-232.00R.

Patterson, W. W., III; and Grapes, Eugene F. Container lash systems. 4,096,816, Cl. 114-75.000.

Paul Forkardt Kommanditgesellschaft: *See—*
Steinberger, Joseph, 4,097,053, Cl. 279-1.00C.

Payne, Cecil; and Payne, Paul E., to Payne, Cecil; Payne, Paul; and Fletcher, Paula, part interest to each. Flap retraction system. 4,097,090, Cl. 298-15.00G.

Payne, Leslie Elmer, to R. J. Reynolds Tobacco Company. Apparatus for transferring cigarettes on a cigarette packaging machine. 4,096,938, Cl. 198-420.000.

Payne, Paul: *See—*
Payne, Cecil; and Payne, Paul E., 4,097,090, Cl. 298-15.00G.

Payne, Paul E.: *See—*
Payne, Cecil; and Payne, Paul E., 4,097,090, Cl. 298-15.00G.

Pazaris, James Oliver: *See—*
Jacobson, Arnold Frederick; and Pazaris, James Oliver, 4,097,736, Cl. 250-252.000.

Peake, Clinton Joseph; Harnish, Wayne Nelson; and Davidson, Bruce Lloyd, to FMC Corporation. Mono-5-substituted-3-chloro-4H-1,2,6-thiadiazin-4-one antifungal agents. 4,097,594, Cl. 424-246.000.

Pearson, Colin Alfred: *See—*
Greene, David James; and Pearson, Colin Alfred, 4,097,322, Cl. 156-149.000.

Pearson, George R., to Flex-O-Lators, Inc. Furniture deck edging. 4,096,596, Cl. 5-360.000.

Pellegrino, Anthony: *See—*
Shapiro, Jonathan S.; Berluti, Vincent, Jr.; Pellegrino, Anthony; and Wagner, Howard G., 4,097,793, Cl. 324-20.00R.

Pelosi, Stanford S., Jr., to Morton-Norwich Products, Inc. 1-[5-(4-Chlorophenyl)furfurylamino]-2-propanol hydrochloride. 4,097,499, Cl. 260-347.700.

Pelosi, Stanford S., Jr., to Morton-Norwich Products, Inc. N-Methyl-5-(4-nitrophenyl)-N-(a-methylphenethyl)furfurylamine hydrochloride. 4,097,500, Cl. 260-347.700.

Pemsler, J. Paul: *See—*
Rappas, Alkis S.; and Pemsler, J. Paul, 4,097,272, Cl. 75-119.000.

Pender, David R. Cargo handling system for aircraft. 4,097,008, Cl. 244-118.00R.

Pennsylvania Engineering Corporation: *See*—
Ziegler, Joseph, 4,097,029, Cl. 266-142.000.
Pennwalt Corporation: *See*—
Sanchez, Jose, 4,097,408, Cl. 252-426.000.
Peper, Henry, Jr.: *See*—
Muller, Frank Andrew; and Peper, Henry, Jr., 4,097,290, Cl. 106-30.000.
Peri, Bruno: *See*—
Pagani, Giorgio; Guerreri, Gianfranco; and Peri, Bruno, 4,097,250, Cl. 55-48.000.
Perica, Jacob E.; Poyer, Wayne F.; and Koenig, Neale F., to Perica, Jacob E. Cardiac monitor with rate limit means. 4,096,854, Cl. 128-2.05T.
Perkin-Elmer Corporation, The: *See*—
Wilson, Francis P.; and Purcell, John E., 4,096,746, Cl. 73-205.00R.
Perline, Irving W.; Trapido, Leonard; Rottenkolber, John J.; and Rottenkolber, Michael L., to Andrew Adams Developing Corporation. Hand tool for fastening and unfastening snap fasteners. 4,096,618, Cl. 29-278.000.
Permahop Hopfenpulver GmbH & Co. KG, Firma: *See*—
Wachter, Rudolf Ludwig; and Edinger, Winfried Franz, 4,096,793, Cl. 99-467.000.
Permax: *See*—
Giulie, Joe D.; and Worcester, Leslie E., 4,097,326, Cl. 156-366.000.
Perronnet, Jacques; Girault, Pierre; and Bonne, Claude, to Roussel Uclaf. 1-(3'-Trifluoromethyl-4'-nitrophenyl)-4,4-dimethyl imidazolidines. 4,097,578, Cl. 424-273.00R.
Perry, Elijah R.; Angwin, Meredith J.; Rabinowitz, Mario; and Shimshock, John F., to Electric Power Research Institute, Inc. Means for protecting underground electrical equipment from thermal runaway. 4,097,682, Cl. 174-15.00R.
Perry, Kenneth E., to Adamation, Inc. Seal tight door for warewasher. 4,096,664, Cl. 49-235.000.
Perry, William V. Denture matching apparatus. 4,096,632, Cl. 32-32.000.
Person, Lucien, to Produits Chimiques Ugine Kuhlmann. Process for separating straight and branched chain soaps and their acids. 4,097,507, Cl. 260-413.000.
Peters, Charles Luther, Jr., to Box Innards, Inc. Indexing and intermittent drive mechanism. 4,096,767, Cl. 74-822.000.
Peters, David L.; and Marr, Philip R., Sr., to Singer Company, The. Precise pointing alignment of optical probes. 4,097,154, Cl. 356-152.000.
Peters, David L., to Singer Company, The. Lag reduction in image transducers having dynamically shaped rasters. 4,097,901, Cl. 358-223.000.
Petersen, Warren D., to Burd, Inc., Howell Division. Chair assembly for an incremental plating having a telescoping sleeve-like construction. 4,097,089, Cl. 297-447.000.
Peterson, Frank C.: *See*—
Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., 4,097,448, Cl. 260-42.180.
Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., 4,097,449, Cl. 260-42.180.
Peterson, Joel R., Sr.: *See*—
Barville, George W.; and Peterson, Joel R., Sr., 4,096,977, Cl. 224-5.0BC.
Petrucci, Primo O., to Danbar, Inc. Rotatable seat support assembly. 4,097,016, Cl. 248-418.000.
Petry, Ronald G., to General Motors Corporation. Telescoping energy absorber with anti-rotational interlock for vehicle bumpers. 4,097,080, Cl. 293-85.000.
Pfahler, Gerhard: *See*—
Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, 4,097,452, Cl. 260-45.80N.
Pfeifer, Josef: *See*—
Mannhardt, Annemarie; Eppe, Rudolf; and Pfeifer, Josef, 4,097,280, Cl. 96-44.000.
Pfeiler, Manfred; and Dietz, Kurt, to Siemens Aktiengesellschaft. X-ray diagnostics system for X-ray photographs. 4,097,741, Cl. 250-322.000.
Pfizer Inc.: *See*—
Kraska, Allen R.; and Schnur, Rodney C., 4,097,525, Cl. 260-564.00R.
Kuhla, Donald E., 4,097,598, Cl. 424-256.000.
Schaaf, Thomas Ken, 4,097,601, Cl. 424-269.000.
Pham, Quang Tho: *See*—
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan Martinov; Pascault, Jean-Pierre; Pham, Quang Tho; Pillot, Christian; and Salle, Robert, 4,097,660, Cl. 526-173.000.
Phillips Petroleum Company: *See*—
Giroux, Victor A., 4,097,371, Cl. 208-313.000.
Hutchinson, William Milton, deceased; and Hutchinson, Florence M., executrix, 4,097,398, Cl. 252-162.000.
Marwil, Stanley J., 4,097,339, Cl. 195-142.000.
Shue, Robert S., 4,097,469, Cl. 260-78.00R.
Young, Jerry W., 4,096,788, Cl. 93-39.00L.
Phillips, Raymond Francis, to Magnesium Elektron Ltd. Aqueous polymeric dispersions made thixotropic by certain ammonium or potassium zirconium carbonates. 4,097,430, Cl. 260-17.00R.
Phillips, Raymond M. Water bed mattress with regulated heating means therefor and controlling the heat loss therefrom and the method of making the same. 4,097,717, Cl. 219-217.000.
Phillips, Victor Quin; Griffin, Phil Harmon; and Sharki, Martin James, to Dresser Industries, Inc. Method of fluid degassing. 4,097,249, Cl. 55-41.000.
Phillips, Victor Quin; Griffin, Phil Harmon; and Sharki, Martin James, to Dresser Industries, Inc. Mud degasser trough. 4,097,253, Cl. 55-169.000.
Phone-Ducs, Inc.: *See*—
Streit, Kenneth F., 4,096,887, Cl. 138-117.000.
Physio-Control Corporation: *See*—
McKelvy, Stephen L., 4,097,113, Cl. 339-256.00R.
Smith, David B.; and Benson, James A., 4,096,856, Cl. 128-4.19D.
Piber, Earl T., to Cutler-Hammer, Inc. Industrial reversing speed control trigger switch with snap-in modules. 4,097,704, Cl. 200-157.000.
Pichon, Michel, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Wheatstone bridge measuring circuit. 4,096,748, Cl. 73-362.0AR.
Picker Corporation: *See*—
Furbee, Avery D.; Kasten, Roy F., Jr.; and Pleil, Viktor W., 4,097,759, Cl. 313-60.000.
Furbee, Avery D.; and Cinelli, Gabriel, 4,097,760, Cl. 313-60.000.
Pierre, Kenneth J.; Tung, Ker-Kong; and Nadj, Henriette, to Beckman Instruments, Inc. Reagent system for beta-amylase assay. 4,097,336, Cl. 195-99.000.
Pillot, Christian: *See*—
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan Martinov; Pascault, Jean-Pierre; Pham, Quang Tho; Pillot, Christian; and Salle, Robert, 4,097,660, Cl. 526-173.000.
Piper, John, to Union Carbide Corporation. Electrolytic capacitor lead terminal configuration. 4,097,916, Cl. 361-433.000.
Pitney-Bowes, Inc.: *See*—
Eckert, Alton B., Jr.; Jones, Howell A., Jr.; and Check, Frank T., Jr., 4,097,923, Cl. 364-900.000.
Luperti, Harry E.; and Manna, Robert E., 4,097,145, Cl. 355-75.000.
Wu, Bosco, 4,097,150, Cl. 356-72.000.
Pittway Corporation: *See*—
Conforti, Frederick J., 4,097,850, Cl. 340-214.000.
Klein, Roy W., 4,097,851, Cl. 340-237.00S.
Pariza, George R., 4,097,861, Cl. 340-388.000.
Pizzini, Louis C.: *See*—
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,097,399, Cl. 252-182.000.
Plasma Physics Corporation: *See*—
Coleman, John H.; and Marks, Tobin J., 4,097,384, Cl. 250-527.000.
Pleil, Viktor W.: *See*—
Furbee, Avery D.; Kasten, Roy F., Jr.; and Pleil, Viktor W., 4,097,759, Cl. 313-60.000.
Pneupac Limited: *See*—
Jones, Norman Stewart; and Bennett, Geoffrey Richard, 4,096,875, Cl. 137-102.000.
Poliniak, Eugene Samuel, to RCA Corporation. Method of transferring a surface relief pattern from a poly(1-methyl-1-cyclopropene sulfone) layer to a non-metallic inorganic layer. 4,097,618, Cl. 427-41.000.
Polva Nederland B.V.: *See*—
Acda, Petrus Marinus, 4,097,070, Cl. 285-86.000.
Polysius, AG: *See*—
Triebel, Wolfgang, 4,096,642, Cl. 34-57.00R.
Porst, Alfred; and Schuh, Gottfried, to Siemens Aktiengesellschaft. Thyristor and method of producing the same. 4,096,623, Cl. 29-580.000.
Porta, Angel Lazaro; and Paniello, Antonio Ibanez, to Doctor Andreu, S.A. [N-(2-diphenylmethoxyethyl)-N-(1-methyl-2-phenoxyethyl)-N-methyl] amine. 4,097,528, Cl. 260-570.00R.
Porta Systems Corp.: *See*—
De Luca, Paul V.; and Atun, Albert, 4,097,102, Cl. 339-19.000.
Portewig, J. Milton. Print machine frame. 4,097,147, Cl. 355-106.000.
Posey, Dan E.; and Mosier, Benjamin, to Chempro Corporation. Mold and mildew removal composition and method of manufacture. 4,097,395, Cl. 252-106.000.
Pote, Wilfred D.: *See*—
Aitken, Thomas; and Pote, Wilfred D., 4,097,427, Cl. 260-9.000.
Potlatch Corporation: *See*—
Saunders, Robert J.; and Keller, Harold A., 4,096,796, Cl. 100-35.000.
Pouliot, Oliver L.: *See*—
Daly, William P.; Lewis, Robert P.; and Pouliot, Oliver L., 4,097,236, Cl. 23-230.00L.
Poulsen, Freddy; and Poulsen, Robert Edvin, to Bell-Matic A/S. Slot machine. 4,097,048, Cl. 273-143.00R.
Poulsen, Robert Edvin: *See*—
Poulsen, Freddy; and Poulsen, Robert Edvin, 4,097,048, Cl. 273-143.00R.
Powrie, William Duncan; and Tung, Marvin, to Creston Valley Foods Ltd. Potato treatment process. 4,097,612, Cl. 426-269.000.
Poyer, Wayne F.: *See*—
Perica, Jacob E.; Poyer, Wayne F.; and Koenig, Neale F., 4,096,854, Cl. 128-2.05T.
PPG Industries, Inc.: *See*—
Barch, Herbert W.; and Bohy, August G., 4,096,685, Cl. 57-34.00B.
Bosso, Joseph F.; and Wismer, Marco, 4,097,352, Cl. 204-181.00C.
Christenson, Roger M.; and Maska, Rudolf, 4,097,438, Cl. 260-29.4UA.
DeTorre, Robert P., 4,096,773, Cl. 83-8.000.
Hathaway, Michael L., 4,097,783, Cl. 315-323.000.
McDonald, Alan T., 4,096,687, Cl. 57-157.00F.
Reese, Walter J., 4,097,004, Cl. 242-129.720.
Schimmel, Karl F.; and Wismer, Marco, 4,097,651, Cl. 428-375.000.
Shaw, Hugh E., Jr., 4,097,151, Cl. 356-73.000.

Prab Conveyors, Inc.: *See—*
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Precision Components Inc.: *See—*
Kuntz, Donald L.; and Kent, David, 4,097,690, Cl. 179-2.00A.
Pregaman, Raymond David: *See—*
Lunn, Norman Laurence; McCrea, Charles Jeffrey; Pregaman, Raymond David; and Turowski, Lawrence Edward, 4,097,625, Cl. 427-360.000.
Price, Billy Frank. Auxiliary compressor assembly. 4,097,202, Cl. 417-454.000.
Price, Robert Bryn: *See—*
Hill, Roland John; Price, Robert Bryn; and Jewell, Norman Thomas, 4,097,820, Cl. 331-94.50G.
Pries, Erich, to Dr. C. Otto & Comp. G.m.b.H. Apparatus for cleaning coke oven doors. 4,097,340, Cl. 202-241.000.
Prince, Dominique: *See—*
Moulin, Jean-Claude; Escher, Balint; and Prince, Dominique, 4,097,415, Cl. 252-512.000.
Pringle, John Philip, to Capital Wire & Cable, Division of U.S. Industries, Inc. Laminated structural member and method of making same. 4,097,648, Cl. 428-326.000.
Prinz, Richard: *See—*
Elghani, Salah Elabd; Fischer, Winfried; and Prinz, Richard, 4,097,429, Cl. 260-17.00R.
Prochnow, Claus, to Rollei-Werke Franke & Heidecke. Adjustment device for photographic enlarging or reproducing apparatus. 4,097,144, Cl. 355-63.000.
Prochnow, Claus: *See—*
Adamski, Gunter; and Prochnow, Claus, 4,097,883, Cl. 354-293.000.
Procter & Gamble Company, The: *See—*
Rolfes, Thomas Richard, 4,097,418, Cl. 252-531.000.
Prodel, Marcel, to Sicame. Hot line clamps. 4,097,108, Cl. 339-109.000.
Production Data Inc.: *See—*
Tonnelli, Gerald J., 4,096,752, Cl. 73-431.000.
Produits Chimiques Ugine Kuhlmann: *See—*
Person, Lucien, 4,097,507, Cl. 260-413.000.
Umemura, Sumio; Ohdan, Kyoji; Uda, Taizo; Matsuzaki, Tokuo; Hidaka, Mikio; Nakamura, Yasuo; and Tsuruoka, Masao, 4,097,518, Cl. 260-465.300.
Prowald, Oswald, to Gerlach-Werke GmbH. Settable regulator device for gas/air mixture ratios. 4,097,219, Cl. 431-90.000.
Pruvot, Francois: *See—*
Pardo, Pierre; and Pruvot, Francois, 4,096,766, Cl. 74-640.000.
Pugh, Gary L.; and Rowlett, Glenford, to Stephens Industries, Inc. Multiple size envelope feeder. 4,097,040, Cl. 271-104.000.
Purcell, John E.: *See—*
Wilson, Francis P.; and Purcell, John E., 4,096,746, Cl. 73-205.00R.
Putkowski, Ladislao W., to Magna International Inc. Filter for liquids. 4,097,216, Cl. 425-568.000.
Pyke, Thomas R.; and Salmond, Marion P., to Upjohn Company, The. Microbial transformation of steroids. 4,097,335, Cl. 195-51.00S.
Quayle, Jackson C. Pole top extension bracket. 4,097,165, Cl. 403-286.000.
Quick Fill, Inc.: *See—*
Roberson, Ronald E., 4,097,724, Cl. 235-92.0FL.
Quin, Murray L.: *See—*
Bobrick, Mitchell; Quin, Murray L.; and Buzan, Morris M., 4,097,919, Cl. 362-270.000.
Quinn, Edwin J.: *See—*
Nichols, James D.; and Quinn, Edwin J., 4,097,432, Cl. 260-23.0XA.
R. G. Dixon & Company Limited: *See—*
Mayo, Haydn Frank, 4,096,599, Cl. 15-49.00R.
R. J. Reynolds Tobacco Company: *See—*
Payne, Leslie Elmer, 4,096,938, Cl. 198-420.000.
Raasch, Hans: *See—*
Stahlecker, Fritz; and Raasch, Hans, 4,096,686, Cl. 57-58.950.
Rabinowitz, Mario: *See—*
Perry, Elijah R.; Angwin, Meredith J.; Rabinowitz, Mario; and Shimshock, John F., 4,097,682, Cl. 174-15.00R.
Rabito, Thomas G.: *See—*
Kieft, Alvin J.; Cline, Richard L.; and Rabito, Thomas G., 4,097,442, Cl. 260-37.00N.
Radici, Pierino; Custro, Sergio; and Colombo, Paolo, to Societa' Italiana Resine S.I.R. S.p.A. Process for the preparation of etherified acetal polymers. 4,097,453, Cl. 260-45.90P.
Radnovation, Incorporated: *See—*
Jacobson, Arnold Frederick; and Pazaris, James Oliver, 4,097,736, Cl. 250-252.000.
Raffaele, Italo, to Rossi, Luigi. Method and apparatus for automatically determining the dilution curve of a solution, particularly the oxygen dissociation curve of blood or hemoglobin solutions. 4,097,921, Cl. 364-416.000.
Rafferty, Edson D.: *See—*
Kletschka, Harold D.; and Rafferty, Edson D., 4,096,864, Cl. 128-354.000.
Ragusa, Anthony. Cigarette dispenser adapter. 4,096,969, Cl. 221-199.000.
Raines, William L.; and Karges, John, Jr., to H. K. Nuttall Equipment Co., Inc. Retractable snowplow wing and mounting therefor. 4,096,652, Cl. 37-41.000.
Ralph, William H. Balloon powered airplane. 4,096,660, Cl. 46-76.00A.
Ralston Purina Company: *See—*
DeLauder, William R.; and Spring, Ferdinand E., 4,097,613, Cl. 426-303.000.
Khayat, Ali, 4,096,734, Cl. 73-23.100.
Rank Xerox, Ltd.: *See—*
Sasamori, Yusuke, 4,097,146, Cl. 355-75.000.
Rao, Mannige Vikram; Coyle, Bernard H., Jr.; and Gallagher, Peter C. J., to N L Industries, Inc. Removal of magnesium from an aluminum alloy. 4,097,270, Cl. 75-68.00R.
Rapidsyn Co.: *See—*
Morreale, Anthony P., 4,096,625, Cl. 29-596.000.
Rappas, Alkis S.; and Pemsler, J. Paul, to Kennecott Copper Corporation. Winning nickel and cobalt with mercaptide extractants and carbon monoxide strip. 4,097,272, Cl. 75-119.000.
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan Martinov; Pascault, Jean-Pierre; Pham, Quang Tho; Pillot, Christian; and Salle, Robert, to Agence Nationale de Valorisation de la Recherche (ANVAR). Heterogeneous anionic polymerization process. 4,097,660, Cl. 526-173.000.
Rauch, Moriz V.: *See—*
Muller, Karl-Heinz; Rauch, Moriz V.; Krisch, Burkhard; and Veneklasen, Lee H., 4,097,739, Cl. 250-311.000.
Rauscher, Walter: *See—*
Mahlein, Hans; and Rauscher, Walter, 4,097,126, Cl. 350-295.000.
Rawlings, Herbert L.; and Baron, Arthur L., to Mobay Chemical Corporation. Glass-filled polycarbonate of improved ductility. 4,097,435, Cl. 260-28.00R.
Raymond Lee Organization, Inc., The: *See—*
Bechtel, Russell D., 4,097,045, Cl. 273-54.00R.
Fernitz, Kenneth, 4,096,895, Cl. 145-29.00R.
Menssen, Leroy K., 4,096,951, Cl. 211-207.000.
O'Herien, Charles R., 4,097,018, Cl. 249-105.000.
St. Jean, Raymond A., 4,096,594, Cl. 5-90.000.
Weatherly, Mark G., 4,096,874, Cl. 135-5.00R.
Raytheon Company: *See—*
Chambers, Derek, 4,097,863, Cl. 343-5.00R.
Jerinic, George; Thoren, Glenn R.; Sullivan, Francis J., Jr.; and Lampen, James L., 4,097,823, Cl. 332-9.00R.
Lampen, James L.; Jerinic, George; and Thoren, Glenn R., 4,097,821, Cl. 331-101.000.
Thoren, Glenn R.; Lampen, James L.; and Jerinic, George, 4,097,817, Cl. 331-56.000.
RCA Corporation: *See—*
Alphonse, Gerard Argant, 4,096,756, Cl. 73-609.000.
Aschwanden, Felix, 4,097,810, Cl. 325-453.000.
Avery, Leslie Ronald, 4,097,896, Cl. 358-153.000.
Bain, George W., Jr.; Forgue, Stanley V.; and Morris, Albert G., 4,097,775, Cl. 313-388.000.
Fisher, Michael Scott, 4,097,770, Cl. 307-252.00J.
Hammer, Jacob Meyer, 4,097,118, Cl. 350-96.170.
Hawrylo, Frank Zygmunt; and Kressel, Henry, 4,097,636, Cl. 428-209.000.
Kern, Werner; and Tracy, Chester Edwin, 4,097,889, Cl. 357-54.000.
Neil, Clyde Carl; Hammer, Jacob Meyer; and Bartolini, Robert Alfred, 4,097,117, Cl. 350-96.170.
Ozga, Stanley Edward, 4,097,920, Cl. 364-200.000.
Poliniak, Eugene Samuel, 4,097,618, Cl. 427-41.000.
Ruedy, John E.; and Morton, George A., 4,097,761, Cl. 313-94.000.
Schlesier, Kenneth Mansfield; Benyon, Carl William, Jr.; and Shaw, Joseph Michael, 4,097,314, Cl. 148-188.000.
Spong, Fred William, 4,097,895, Cl. 358-128.000.
Yu, John Pang, 4,097,899, Cl. 358-181.000.
Reams, Lowell A.; and Geddes, Andrew E., to Ford Motor Company. Engine driven heating system components for Stirling engines. 4,096,695, Cl. 60-517.000.
Recognition Equipment Incorporated: *See—*
Lafevers, James O.; and Kao, Charles T., 4,097,910, Cl. 360-126.000.
Reedy, James D.: *See—*
Yang, Kang; Motz, Kaye L.; and Reedy, James D., 4,097,535, Cl. 260-603.00C.
Reese, Walter J., to PPG Industries, Inc. Method and apparatus for unwinding roving packages from the inside. 4,097,004, Cl. 242-129.720.
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Reichelt, Walter R., Jr.; and Hoy, Malcolm G., to Aluminum Company of America. Welding method. 4,097,716, Cl. 219-137.00R.
Reichenbach, William. Tire plug for tubeless tires. 4,096,901, Cl. 152-370.000.
Reinhold, Donald F., to Merck & Co., Inc. Pyroglutamic acid salts of t-butylamino-2,3-dihydroxypropane. 4,097,490, Cl. 260-326.450.
Reisdorff, Josef Helmut; Brandes, Wilhelm; Scheinpflug, Hans; Homeyer, Bernhard; and Roessler, Peter, to Bayer Aktiengesellschaft. 2-Substituted-5-trifluoromethyl-1,3,4-thiadiazoles. 4,097,669, Cl. 542-413.000.
Rejmanova, Pavla: *See—*
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Renirie, Alexis C. M., to Vitatron Medical B.V. Low current drain amplifier system. 4,097,766, Cl. 307-229.000.

Renz, Mical C.: *See—*
Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., 4,097,448, Cl. 260-42.180.
Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., 4,097,449, Cl. 260-42.180.

Restelli, Edward F., Jr.: *See—*
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Rethy, Maria: *See—*
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Reuschel, Konrad; and Schink, Norbert, to Siemens Aktiengesellschaft. Method of producing silicon useful for semiconductor component manufacture. 4,097,584, Cl. 423-348.000.

Rexnord Inc.: *See—*
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Reynolds, Christopher I.: *See—*
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Rhoades, Carl E.: *See—*
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Rhodes, Robin B.; and Vobecky, Paul, to Isothermics, Inc. Tool assembly for forming internal grooves in tubes. 4,096,723, Cl. 72-123.000.

Rice, Roy W.; Wynne, Kenneth J.; and Fox, William B., to United States of America, Navy. Preparation of ceramics. 4,097,294, Cl. 106-43.000.

Richardson, Edwin A.: *See—*
McLaughlin, William A.; and Richardson, Edwin A., 4,096,914, Cl. 166-307.000.

Richdel, Inc.: *See—*
Saarem, Myrl J., 4,097,763, Cl. 307-141.000.

Richman, William M. Fireplace ash system for basementless buildings. 4,096,848, Cl. 126-120.000.

Richmond, Kenneth D.; Hartman, Russell E.; Rogers, Jerry W.; and Nelson, Jack, to Dayco Corporation. Power transmission belt structure and method of making same. 4,096,764, Cl. 74-233.000.

Richter, Sidney B.: *See—*
Hotz, Roger D.; Stach, Leonard J.; and Richter, Sidney B., 4,097,491, Cl. 260-340.700.

Richter, Wolfgang: *See—*
Krambrock, Wolfgang; Schwedes, Hansjorg; Richter, Wolfgang; and Elgeti, Klaus, 4,096,640, Cl. 34-10.000.

Ricoh Company, Ltd.: *See—*
Fujimoto, Sakae, 4,097,041, Cl. 271-114.000.
Suzuki, Kohji; and Tagawa, Kazuaki, 4,097,140, Cl. 355-15.000.

Riddle, Parvin; and Reynolds, Christopher I., to Riddle, Parvin. Depth sound indicator. 4,097,836, Cl. 340-3.00C.

Riebel, Hans-Jochem: *See—*
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Rieber & Son A/S: *See—*
Parmann, Gunnar, 4,097,573, Cl. 264-322.000.

Riedel-de Haen Aktiengesellschaft: *See—*
Hirsch, Wolfgang, 4,097,240, Cl. 23-253.0TP.

Rieth, Kurt Albert, to Textron Inc. Expansible linkage for wrist watch bracelets, identification bracelets and the like. 4,096,688, Cl. 59-79.00R.

Rigazio, Anthony W., to General Time Corporation. Synchronous motor. 4,097,757, Cl. 310-162.000.

Riggs, Darius O.; and Vogel, Charles G., to Owens-Illinois, Inc. Apparatus for feeding glass containers at spaced intervals. 4,096,939, Cl. 198-460.000.

Riker Laboratories, Inc.: *See—*
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Rindfleisch, Volker: *See—*
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Ringle, John, III. Power drive for a venetian blind. 4,096,903, Cl. 160-176.00R.

Rist, Bruno A.: *See—*
Tanner, James L.; Rist, Bruno A.; Sanchez, George; and Becht, Balazs, 4,097,894, Cl. 358-118.000.

Ritchie, Kim: *See—*
Mar, Kenneth M.; Ritchie, Kim; and Smith, James N., 4,097,834, Cl. 338-21.000.

Ritter, Arthur J., Jr., to Caterpillar Tractor Co. Axle pulling means. 4,096,617, Cl. 29-278.000.

Ritter Company, The: *See—*
Rodish, John, 4,096,987, Cl. 229-55.000.

Ritter, Gerhard: *See—*
Ritter, Klaus; Ritter, Gerhard; and Ritter, Josef, 4,096,680, Cl. 52-665.000.

Ritter, Josef: *See—*
Ritter, Klaus; Ritter, Gerhard; and Ritter, Josef, 4,096,680, Cl. 52-665.000.

Ritter, Klaus; Ritter, Gerhard; and Ritter, Josef, to AVI Alpenlandische Veredelungs- Industrie Gesellschaft mbH., Firma. Reinforcement grid for steel concrete construction. 4,096,680, Cl. 52-665.000.

Ritter, Klaus: *See—*
Sandau, Hartmut; Weigert, Wilhelm; Steinel, Winfried; Kraisel, August; Ritter, Klaus; Gaub, Erwin; and Kochendorfer, Heinrich, 4,096,787, Cl. 92-260.000.

Ritzenthaler, Donald R.; and Erickson, Frederick E., to Gulf & Western Industries, Inc. Relay with manually releasable latch. 4,097,832, Cl. 335-166.000.

Ritzler, Bo, to AB Filtrator. Separator with throw-away container. 4,097,381, Cl. 210-259.000.

Riuli, Arduino E.; and Kopacz, Bernard F., to Becton, Dickinson and Company. Ring opener for hermetically sealed molded plastic containers. 4,096,962, Cl. 215-32.000.

Rivkin, Ilya Yakovlevich; Aisin, Shamil Mustafovich; Garkusha, Olga Ivanovna; Dondoshansky, Alexandr Lvovich; Zellis, Evgeny Alfredovich; Karpov, Vladilen Efremovich; Sorokin, Vladimir Konstantinovich; and Shishkin, Oleg Petrovich. Method and apparatus for measuring mass flow rate of individual components of two-phase gas-liquid medium. 4,096,745, Cl. 73-194.00B.

Roberson, Ronald E., to Quick Fill, Inc. Fuel vending apparatus and method. 4,097,724, Cl. 235-92.0FL.

Robert, Andre, to Upjohn Company, The. Gastric cytoprotection with non-antisecretory doses of prostaglandins. 4,097,603, Cl. 424-305.000.

Robert Bosch GmbH: *See—*
Eckert, Konrad; Hofmann, Karl; and Seifert, Kurt, 4,096,999, Cl. 239-533.500.
Horstmann, Winfried, 4,097,907, Cl. 360-33.000.
Sandau, Hartmut; Weigert, Wilhelm; Steinel, Winfried; Kraisel, August; Ritter, Klaus; Gaub, Erwin; and Kochendorfer, Heinrich, 4,096,787, Cl. 92-260.000.
Schonherr, Erich, 4,097,206, Cl. 418-78.000.
Wanner, Karl; Reibetanz, Wilbert; Bleicher, Manfred; and Wiesner, Herbert, 4,097,176, Cl. 408-56.000.

Roberton & Schwartz, Inc.: *See—*
Schwartz, William H., 4,097,083, Cl. 294-78.00A.

Robertson, Peter Murday. Electrochemical oxidation of diacetone-L-sorbose to diacetone-L-ketogulonic acid. 4,097,346, Cl. 204-80.000.

Robinson, Lloyd A., to Stanford Research Institute. Orthogonal-port, biconical-horn, direction-finder antenna. 4,097,869, Cl. 343-773.000.

Rocco, Jack O., to Clark Equipment Company. Dual low lift truck. 4,096,961, Cl. 214-510.000.

Rockwell International Corporation: *See—*
Appert, Quentin D., 4,097,155, Cl. 356-152.000.
Sallee, Gary F., 4,096,740, Cl. 73-88.50R.

Roddy, Joseph T., to Emerson Electric Co. Molded enclosure having zero draft openings formed in it. 4,097,706, Cl. 200-293.000.

Rodish, John, to Ritter Company, The. Reinforced paper bag. 4,096,987, Cl. 229-55.000.

Rody, Jean: *See—*
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,097,587, Cl. 260-45.80A.

Roessler, Peter: *See—*
Reisdorff, Josef Helmut; Brandes, Wilhelm; Scheinpflug, Hans; Homeyer, Bernhard; and Roessler, Peter, 4,097,669, Cl. 542-413.000.

Rogers, Jerry W.: *See—*
Richmond, Kenneth D.; Hartman, Russell E.; Rogers, Jerry W.; and Nelson, Jack, 4,096,764, Cl. 74-233.000.

Rogic, Milorad M.; Demmin, Timothy R.; and Klein, Karl P., to Allied Chemical Corporation. Cleavage of alpha-oximinoketones, aldehydes and acetals and their nitroso isomers. 4,097,517, Cl. 260-465.400.

Rohe, Lothar: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,097,592, Cl. 424-200.000.

Rohm GmbH: *See—*
Neumann, Helmut, 4,097,649, Cl. 428-327.000.

Rohm and Haas Company: *See—*
Emmons, William D.; and Nyi, Kayson, 4,097,677, Cl. 560-220.000.

Rohrscheid, Freimund, to Hoechst Aktiengesellschaft. Process for the preparation of naphthalene-1,4,5,8-tetracarboxylic acid. 4,097,492, Cl. 260-345.200.

Rolfes, Thomas Richard, to Procter & Gamble Company, The. Granular colored speckles. 4,097,418, Cl. 252-531.000.

Rollei-Werke Franke & Heidecke: *See—*
Adamski, Gunter; and Prochnow, Claus, 4,097,883, Cl. 354-293.000.
Prochnow, Claus, 4,097,144, Cl. 355-63.000.

Rolls-Royce Limited: *See—*
Hill, Roland John; Price, Robert Bryn; and Jewell, Norman Thomas, 4,097,820, Cl. 331-94.50G.

Rolnick, Edward M., to Gulf & Western Manufacturing Company. Combination tap and die wrench. 4,097,182, Cl. 408-239.00R.

Romanillos, Federico Hernando. System in an industrial polyexpansion process. 4,097,210, Cl. 425-89.000.

Romano, Ugo, to Anic S.p.A. Method for the preparation of aromatic urethans. 4,097,676, Cl. 560-132.000.

Roof, Douglas L.: *See—*
Hall, Walter Dennis; Miller, Merrell Thomas; and Roof, Douglas L., 4,096,772, Cl. 82-82.000.

Rosemount Inc.: *See—*
De Leo, Richard V.; and Hagen, Floyd W., 4,096,744, Cl. 73-180.000.

Rosen, Marvin: *See—*
Keyworth, Donald A.; Di Bella, Eugene P.; and Rosen, Marvin, 4,097,451, Cl. 260-45.70R.

Rosenthale, Marvin E.: *See—*
Begany, Albert J.; Rosenthale, Marvin E.; and Dervinis, Alphonse, 4,097,596, Cl. 424-247.000.
Roskott, Lodewijk; and Schroeder, Arnold, to Akzona Incorporated. Process for the preparation of a copolymerizable composition. 4,097,467, Cl. 260-75.0UA.
Rosling, Denys Reginald, to Babcock & Wilcox Company, The. Furnace cover. 4,097,228, Cl. 432-250.000.
Rossi, Luigi: *See—*
Raffaele, Italo, 4,097,921, Cl. 364-416.000.
Rossner, Ewald: *See—*
Bilbert, Paul; and Rossner, Ewald, 4,096,760, Cl. 73-738.000.
Rostfria Tak Aktiebolag: *See—*
Netterstedt, Sture; and Lindstrand, Bengt, 4,096,681, Cl. 52-713.000.
Roth, John F.: *See—*
Glecker, Donald Leroy; Roth, John F.; and Bosch, Peter N., 4,096,728, Cl. 72-345.000.
Rothmans of Pall Mall Canada Limited: *See—*
Sheahan, Michael H., 4,096,682, Cl. 53-149.000.
Rottenkolber, John J.: *See—*
Perline, Irving W.; Trapido, Leonard; Rottenkolber, John J.; and Rottenkolber, Michael L., 4,096,618, Cl. 29-278.000.
Rottenkolber, Michael L.: *See—*
Perline, Irving W.; Trapido, Leonard; Rottenkolber, John J.; and Rottenkolber, Michael L., 4,096,618, Cl. 29-278.000.
Rourke, Terence Arthur. Process and apparatus for calcining limestone. 4,097,225, Cl. 432-96.000.
Roussel Uclaf: *See—*
Buendia, Jean; and Schalbar, Jeanine, 4,097,494, Cl. 260-345.80P.
Heymes, Rene, 4,097,595, Cl. 424-246.000.
Perronnet, Jacques; Girault, Pierre; and Bonne, Claude, 4,097,578, Cl. 424-273.00R.
Rowlett, Glenford: *See—*
Pugh, Gary L.; and Rowlett, Glenford, 4,097,040, Cl. 271-104.000.
Royston, Calvin T.: *See—*
Seiferth, Oscar E.; and Royston, Calvin T., 4,097,611, Cl. 426-121.000.
Rozga, Vincent E., to Kelley Company, Inc. Backstop construction for a stacking machine. 4,097,042, Cl. 271-171.000.
Ruckdeschel, Frederick R.: *See—*
Hauser, Oscar G.; Meagher, Thomas; and Ruckdeschel, Frederick R., 4,097,139, Cl. 355-4.000.
Rudy, Richard, to Kilgore Corporation. Playground climber. 4,097,043, Cl. 272-113.000.
Ruedy, John E.; and Morton, George A., to RCA Corporation. Image tube cathode. 4,097,761, Cl. 313-94.000.
Rumball, Kenneth Francis, to Airfix Industries Limited. Composite lid. 4,096,963, Cl. 215-317.000.
Runyan, Walter Warren: *See—*
Papa, Anthony Joseph; and Runyan, Walter Warren, 4,097,559, Cl. 260-928.000.
Rupp, Roland; Schnoring, Hildegard; Schellmann, Erhard; and Bauer, Kurt, to Bayer Aktiengesellschaft. Method for testing filled glass containers. 4,096,738, Cl. 73-52.000.
Rush-Presbyterian-St. Luke's Medical Center: *See—*
Bacus, James W., 4,097,845, Cl. 340-146.3CA.
Russell, John S., to Russkraft, Inc. Lifting grab for cylindrical objects. 4,097,084, Cl. 294-104.000.
Russell, Lewis K., to Signetics Corporation. High density collector-up structure. 4,097,888, Cl. 357-46.000.
Russell, Peter John: *See—*
Cubbon, Robert Charles Patrick; Russell, Peter John; Talbot, Robert Eric; and Woodbridge, David Thomas, 4,097,536, Cl. 260-610.00R.
Russkraft, Inc.: *See—*
Russell, John S., 4,097,084, Cl. 294-104.000.
Ruti-te Strake B.V.: *See—*
Larmit, Adrianus Johannes Franciscus, 4,096,889, Cl. 139-435.000.
Rutishauser, Heinz: *See—*
Bartels, Hermann; Gallati, Fritz; Lang, Karl; and Rutishauser, Heinz, 4,096,972, Cl. 222-135.000.
Rutledge, Thomas F., to ICI Americas Inc. Oxidative coupling of alkylphenols or 1-naphthols catalyzed by metal complexes of diketo compounds. 4,097,461, Cl. 260-47.0ET.
Rys, Tadeusz J., to I-T-E Imperial Corporation. Latch for contact operating mechanism. 4,097,830, Cl. 335-21.000.
Rzeszewski, Theodore S., to Matsushita Electric Corporation. Frequency selective detector circuit. 4,097,812, Cl. 328-138.000.
S. A. des Anciens Etablissements Paul Worth: *See—*
Mailliet, Pierre, 4,097,033, Cl. 266-271.000.
S.T. Dupont: *See—*
Faudemay, Edmond L. J., 4,097,222, Cl. 431-143.000.
Saarem, Myrl J., to Richdel, Inc. Electric programmer. 4,097,763, Cl. 307-141.000.
Sachs Systemtechnik: *See—*
Fischer, Wolfgang, 4,097,355, Cl. 204-228.000.
Sack, Stuart, to Occidental Petroleum Corporation. Quenching pyrolysis reactor effluent streams. 4,097,360, Cl. 208-8.000.
Sackmann, Karl-Hans: *See—*
Langenbach, Erwin; and Sackmann, Karl-Hans, 4,097,733, Cl. 250-221.000.
Sadler, Fred S.: *See—*
Lapp, John; and Sadler, Fred S., 4,097,912, Cl. 361-318.000.
Lapp, John; and Sadler, Fred S., 4,097,913, Cl. 361-318.000.
Saegusa, Katsumi: *See—*
Mizutani, Hiroshi; Tamura, Masaru; and Saegusa, Katsumi, 4,097,397, Cl. 252-153.000.
Safety-Kleen Corporation: *See—*
Otzen, Karl G., 4,096,873, Cl. 134-135.000.
Saidl, Jaroslav: *See—*
Guber, Walter; Saidl, Jaroslav; Daruschy, Paul; and Hild, Werner, 4,097,401, Cl. 252-301.10W.
St. Clair, John Craig. Multiple effect evaporation of water from water containing combustible sludges. 4,097,378, Cl. 210-67.000.
Saint Gobain Industries: *See—*
Brax, Jean Albert, 4,097,259, Cl. 65-327.000.
St. Jean, Raymond A., to Raymond Lee Organization, Inc., The, a part interest. Mattress device. 4,096,594, Cl. 5-90.000.
St. Joe Minerals Corporation: *See—*
Lunn, Norman Laurence; McCrea, Charles Jeffrey; Pregaman, Raymond David; and Turowski, Lawrence Edward, 4,097,625, Cl. 427-360.000.
Saito, Shoichi, to Olympus Optical Co., Ltd. Magnetic tape cassette. 4,097,006, Cl. 242-199.000.
Sakai, Tomoya; and Negishi, Naoki, to Kogyo Kaihatsu Kenkyusho (Industrial Research Institut). Process of producing mainly monocyclic aromatic compounds from unutilized carbon resources mainly composed of polycyclic aromatic compounds. 4,097,541, Cl. 260-668.00R.
Sakai, Yasuyuki: *See—*
Nohira, Hidetaka; Bessho, Hironori; and Sakai, Yasuyuki, 4,096,691, Cl. 60-295.000.
Sakurai, Yoshio: *See—*
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Salem, Harry; and Aviado, Domingo M., to Cooper Laboratories, Incorporated. Method of lowering intraocular pressure with antazoline. 4,097,577, Cl. 424-273.00R.
Salle, Robert: *See—*
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan Martinov; Pascault, Jean-Pierre; Pham, Quang Tho; Pillot, Christian; and Salle, Robert, 4,097,660, Cl. 526-173.000.
Sallee, Gary F., to Rockwell International Corporation. Surface acoustic wave strain detector and gage. 4,096,740, Cl. 73-88.50R.
Salmond, Marion P.: *See—*
Pyke, Thomas R.; and Salmond, Marion P., 4,097,335, Cl. 195-51.00S.
Salomon, Georges Pierre Joseph, to Etablissements Francois et Fils. Ski binding. 4,097,062, Cl. 280-618.000.
Salvo, Gaetano. Electronic tennis scoring system. 4,097,855, Cl. 340-323.00R.
Samolis, Alfonso A. Gas filter cleaning apparatus. 4,097,255, Cl. 55-294.000.
Sanchez, George: *See—*
Tanner, James L.; Rist, Bruno A.; Sanchez, George; and Becht, Balazs, 4,097,894, Cl. 358-118.000.
Sanchez, Jose, to Pennwalt Corporation. Diperoxyester mixture prepared by reacting dihydroperoxides and carbonyls. 4,097,408, Cl. 252-426.000.
Sand, Robert H., to Vulcan Radiator Company, The. Baseboard heater. 4,097,720, Cl. 219-366.000.
Sandau, Hartmut; Weigert, Wilhelm; Steinel, Winfried; Kraisel, August; Ritter, Klaus; Gaub, Erwin; and Kochendorfer, Heinrich, to Robert Bosch GmbH. Cylinder-and-piston arrangement and method of manufacturing the same. 4,096,787, Cl. 92-260.000.
Sanders Associates, Inc.: *See—*
Carey, Charles, 4,097,110, Cl. 350-149.000.
Sanderson, Ian S.: *See—*
Gray, Alden J.; Sanderson, Ian S.; and Hardy, John C., 4,096,624, Cl. 29-596.000.
Sandhu, M. Akram, to Eastman Kodak Company. Method for transferring heat-transferable dyes. 4,097,230, Cl. 8-2.50A.
Sandoz, Inc.: *See—*
Barcza, Sandor; and Hendrickson, James B., 4,097,609, Cl. 424-331.000.
Sandoz Ltd.: *See—*
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Sandrock, Gary Dale, to International Nickel Company, Inc., The. Nickel-mischmetal-calcium alloys for hydrogen storage. 4,096,639, Cl. 34-15.000.
Sandrock, Gary Dale, to International Nickel Company, Inc., The. Method for storing hydrogen in nickel-calcium. 4,096,641, Cl. 34-15.000.
Sankyo Company, Limited: *See—*
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,097,587, Cl. 260-45.80A.
Sankyo Kogaku Kogyo Kabushiki Kaisha: *See—*
Katagiri, Tohru, 4,097,881, Cl. 354-155.000.
Sankyo Special Steel Co., Ltd.: *See—*
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Sano, Hironari: *See—*
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Sano, Youzi: *See*—
Ishibashi, Toshihiro; Horibe, Kinya; Ishida, Masaharu; and Sano, Youzi, 4,097,311, Cl. 148-6.210.
Sansui Electric Co., Ltd.: *See*—
Sato, Mituhiro; and Kato, Tomomi, 4,097,785, Cl. 318-89.000.
Sanuki, Setsuo: *See*—
Nakamura, Masayuki; and Sanuki, Setsuo, 4,097,443, Cl. 260-38.000.
Sanz Hernandez, Jose Antonio; and Netto, Cassiano Mesquita, to Eucatex, S.A. Decorative panel. 4,097,635, Cl. 428-172.000.
Sarantakis, Dimitrios; and Stein, Larry, to American Home Products Corporation. Polypeptides with morphine-like activity. 4,097,471, Cl. 260-112.50R.
Sarosi, Gyula: *See*—
Simon, Artur; Sarosi, Gyula; Keszler, Balazs; Toth, Attila; and Rethy, Maria, 4,097,658, Cl. 526-143.000.
Sarti, Dino: *See*—
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Sasaki, Mitsuo: *See*—
Cooke, William Ernest; Hodgson, John; and Sasaki, Mitsuo, 4,097,342, Cl. 204-28.000.
Sasamori, Yusuke, to Rank Xerox, Ltd. Original handling system and process. 4,097,146, Cl. 355-75.000.
Sato, Kanji, to Tokai Denka Kogyo Kabushiki Kaisha. Process for preparing pyrazines. 4,097,478, Cl. 544-353.000.
Sato, Kozo: *See*—
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; and Shinozaki, Nobuo, 4,097,755, Cl. 310-114.000.
Sato, Mituhiro; and Kato, Tomomi, to Sansui Electric Co., Ltd. Magnetic-tape-transport apparatus. 4,097,785, Cl. 318-89.000.
Sato, Moriyuki: *See*—
Nara, Takashi; Okachi, Ryo; Yamamoto, Mitsuyoshi; Mori, Yasuki; Sato, Moriyuki; Sugimoto, Masahiro; and Shimizu, Yoshiaki, 4,097,428, Cl. 260-345.90R.
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Sato, Takeshi: *See*—
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Satoh, Ken; and Tomizawa, Yoshio, to Olympus Optical Co., Ltd. Tape ending indicator for tape recorder. 4,097,726, Cl. 235-92.0MP.
Satou, Haruhiko; Honiden, Yoshinori; Hayashida, Motoyuki; and Wakamoto, Mutsuo, to Toyo Kogyo Co. Ltd. Rotary piston internal combustion engine. 4,096,828, Cl. 123-209.000.
Saucy, Gabriel: *See*—
Chan, Ka-Kong; and Saucy, Gabriel, 4,097,495, Cl. 260-345.500.
Sauder, Myrl, to Sauder Woodworking Co. Panel assembly. 4,097,100, Cl. 312-257.00A.
Sauder Woodworking Co.: *See*—
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Saunders, Robert J.; and Keller, Harold A., to Potlatch Corporation. Apparatus and method for controlling press racking. 4,096,796, Cl. 100-35.000.
Saurwein, Albert C. Athletic shoe sole. 4,096,649, Cl. 36-32.00R.
Sayre, James Franklin, to Du Pont de Nemours, E. I., and Company. Process for making stretch fabric capable of course count control upon heat setting. 4,096,609, Cl. 28-155.000.
Scan-Optics, Inc.: *See*—
Forsen, George E.; and Jackson, Stephen F., 4,097,847, Cl. 340-146.3AE.
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Brauer, Harald Otto Christian; Jensen, Knud Sejr; Andreasen, Torben; Jensen, Hilmer; Greve, Mogens; and Kurstein, Peter, 4,097,320, Cl. 156-109.000.
Schaaf, Thomas Ken, to Pfizer Inc. Bone deposition by 2-descarboxy-2-(tetrazol-5-yl)-11-dexosy-16-aryl prostaglandins. 4,097,601, Cl. 424-269.000.
Schabert, Hans-Peter; and Laurer, Erwin, to Kraftwerk Union Aktiengesellschaft. Nuclear-reactor steam-generator shut-off valve. 4,096,881, Cl. 137-492.000.
Schaefer, Wolfgang: *See*—
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Schaffler, Georg, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Garbage collecting and transport vehicle. 4,096,959, Cl. 214-302.000.
Schalbar, Jeanine: *See*—
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Schallus, Erich: *See*—
Dany, Franz-Josef; Mietens, Gerhard; and Schallus, Erich, 4,097,656, Cl. 526-1.000.
Schauer, George A., to Sundstrand Corporation. Rotary fluid energy translating device. 4,096,786, Cl. 91-499.000.
Scheben, John A., to National Distillers and Chemical Corporation. Liquid phase process for the production of aromatic aldehydes. 4,097,533, Cl. 260-599.000.
Schechter, Sheldon. Printed coupon folder. 4,097,067, Cl. 283-56.000.
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Schild, Josef; Scheiber, Robert; Schmidt, Harald; Drasch, Josef; and Keznickl, Eduard, 4,097,906, Cl. 360-13.000.
Scheinpflug, Hans: *See*—
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Schell, Charles E.; Deegan, Dennis C.; and Jacques, Donald F., to Betz Laboratories, Inc. Measuring corrosion rate under specified heat transfer conditions. 4,097,341, Cl. 204-1.00T.
Schellmann, Erhard: *See*—
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Schering Aktiengesellschaft: *See*—
Kerb, Ulrich; Wiechert, Rudolf; and Engelfried, Otto, 4,097,678, Cl. 560-257.000.
Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,097,334, Cl. 195-51.00G.
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Schild, Josef; Scheiber, Robert; Schmidt, Harald; Drasch, Josef; and Keznickl, Eduard, to Vockenhuber, Karl; and Hauser, Raimund. Inter-record gap recording or playback apparatus. 4,097,906, Cl. 360-13.000.
Schimmel, Karl F.; and Wismer, Marco, to PPG Industries, Inc. Substrates coated with end and intermediate reaction products of a dianhydride and a hydrazine or hydrazide. 4,097,651, Cl. 428-375.000.
Schimming, Fred H., to Clardy, Roland; and Green, Ray, part interest to each. Pendulum. 4,096,638, Cl. 33-396.000.
Schink, Norbert: *See*—
Reuschel, Konrad; and Schink, Norbert, 4,097,584, Cl. 423-348.000.
Schladitz, Hermann J., to University of Virginia. Apparatus for metallization of fibers. 4,096,823, Cl. 118-48.000.
Schladitz, Hermann J., to University of Virginia. Method for the metallization of fibers. 4,097,624, Cl. 427-251.000.
Schlesier, Kenneth Mansfield; Benyon, Carl William, Jr.; and Shaw, Joseph Michael, to RCA Corporation. Method of making a sapphire gate transistor. 4,097,314, Cl. 148-188.000.
Schliepe, Reinhard: *See*—
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Schmidbaur, Hubert; and Gasser, Oswald, to Hoechst Aktiengesellschaft. Double-ylide metal complexes. 4,097,509, Cl. 260-430.000.
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Schild, Josef; Scheiber, Robert; Schmidt, Harald; Drasch, Josef; and Keznickl, Eduard, 4,097,906, Cl. 360-13.000.
Schmidt, Jon Jay: *See*—
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Schmidt, Michael P.: *See*—
Anderson, Leroy E.; Schmidt, Michael P.; and Weaver, William W., 4,096,720, Cl. 72-50.000.
Schmidt, Robert August: *See*—
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Schneider, Walter. Process and apparatus for the production of laminated sheets. 4,097,629, Cl. 428-71.000.
Schnier, Edward A., to A-T-O Inc. Label-applying apparatus for applying thermoplastic labels. 4,097,325, Cl. 156-215.000.
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Rupp, Roland; Schnoring, Hildegard; Schellmann, Erhard; and Bauer, Kurt, 4,096,738, Cl. 73-52.000.
Schnur, Joel M.; Miller, Richard S.; Sheridan, James P.; and Britt, A. D., to United States of America, Navy. Desensitizing agent for compositions containing crystalline high-energy nitrates or nitrites. 4,097,317, Cl. 149-7.000.
Schnur, Rodney C.: *See*—
Kraska, Allen R.; and Schnur, Rodney C., 4,097,525, Cl. 260-564.00R.
Scholten, Frank L.; and Szabo, Francis S., to Addressograph-Multigraph Corporation. Shaft encoder. 4,097,875, Cl. 354-8.000.
Schonherr, Erich, to Robert Bosch GmbH. Gear pump or motor with bypass throttle passage to prevent cavitation. 4,097,206, Cl. 418-78.000.
Schorken, Karl: *See*—
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Schreyer, Kenneth D., to Columbus McKinnon Corporation. Hand hoist/puller operating handle/lever. 4,097,024, Cl. 254-169.000.
Schroder, Martin: *See*—
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Schroder, Martin, 4,097,623, Cl. 427-230.000.

Schroder, Rolf: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,097,592, Cl. 424-200.000.
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Schroeder, Manfred; and Schaefer, Wolfgang, to Chemische Werke Huels Aktiengesellschaft. Process for the production of squaric acid. 4,097,530, Cl. 260-586.00P.
Schuck, James M.: *See*—
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Diels, Manfred; Dienstuhl, Karl Wilhelm; Jager, Tilo; and Hocker, Eitel, 4,096,678, Cl. 52-403.000.
Schuh, Frank J., to Atlantic Richfield Company. Underwater wellhead testing. 4,096,737, Cl. 73-46.000.
Schuh, Gottfried: *See*—
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Schupp, Lewis J.: *See*—
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Schuster, Stanley Everett: *See*—
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Hofmann, Hans Joachim; and Jankewitz, Axel, 4,097,289, Cl. 106-26.000.
Schwartz, Judd Leonard; and Mayer, Richard Eugene, to Allied Chemical Corporation. Flame retardant carpet. 4,097,630, Cl. 428-97.000.
Schwartz, William H., to Roberton & Schwartz, Inc. Adjustable lifting thimble. 4,097,083, Cl. 294-78.00A.
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SCM Corporation: *See*—
Bledsoe, James O., Jr.; and Johnson, Walter E., Jr., 4,097,531, Cl. 260-586.00R.
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Scott, Robert N.; and Knowles, Thomas A., to Olin Corporation. Glycol and silicate-based surfactant composition. 4,097,406, Cl. 252-351.000.
Scotto, Anthony J.: *See*—
Carlson, Karl, 4,097,380, Cl. 210-170.000.
Scuricini, Giovan Battista, to Comitato Nazionale per l'Energia Nucleare. Method and an apparatus for the dynamic balancing of rotating bodies, particularly for centrifuges. 4,096,988, Cl. 233-23.00A.
Seaman Corporation: *See*—
Pabst, Alton L., 4,096,669, Cl. 52-63.000.
Sears, Barry D. Phosphatidyl sulfonium hydroxide compounds. 4,097,502, Cl. 260-399.000.
Sears, Barry D. Phosphatidyl phosphonium hydroxide compounds. 4,097,503, Cl. 260-403.000.
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Seidel, Sigurd, to Skischuhfabrik Dynafit Gesellschaft m.b.H. Footwear. 4,096,650, Cl. 36-120.000.
Seifert, Kurt: *See*—
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Seiferth, Oscar E.; and Royston, Calvin T., to Oscar Mayer & Co. Inc. Sliced food package with side windows. 4,097,611, Cl. 426-121.000.
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Seitz, James F.: *See*—
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Seki, Chichitada; and Furuhashi, Nobuo, to Nissan Motor Company, Limited. Idle mixture adjusting device of carburetor. 4,097,561, Cl. 261-41.00D.
Seligman, Lawrence; Ballard, James P.; and Jeffery, Edwin A., to Data General Corporation. Scanning system and method. 4,097,729, Cl. 235-467.000.
Selway, Peter Richard; Chown, Martin; Epworth, Richard Edward; Leggett, Norman Derek; and Sunak, Harish Ram Dass, to International Standard Electric Corporation. Laser stud mounts. 4,097,891, Cl. 357-81.000.
Selwood, Peter Richard, deceased: *See*—
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Selwood, Timothy John; Axtell, Martin John Shelley; Burton, John David; Selwood, Peter Richard, deceased; by Selwood, Timothy John, executor; and by Axtell, Martin John Shelly, executor, to William R. Selwood Limited. Reciprocating piston pump. 4,097,203, Cl. 417-480.000.
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Sendov, Stoyan Hristov; Kuklin, Ivan Alexandrov; Nikolov, Ivan Angelov; Ivanov, Assen Ninov; Mirchev, Mircho Georgiev; and Kurtashev, Radoslav Borissov, to Chimkombinat. Apparatus for mixing bulk materials. 4,097,927, Cl. 366-247.000.
Senet, Jean-Pierre G.: *See*—
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Senju Metal Industry Co., Ltd.: *See*—
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Sentrol Systems Ltd.: *See*—
DeRemigis, Joseph, 4,097,153, Cl. 356-103.000.
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Serur, Juan Ricardo; and Loeffler, Herbert Heinz, to International Biomedical Laboratories, Inc. Adjustable fluid flow regulator. 4,096,879, Cl. 137-391.000.
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Shaffer, John W.; and Audesse, Emery G., to GTE Sylvania Incorporated. Photoflash lamp with combustible filament. 4,097,221, Cl. 431-95.00R.
Shakespeare Company: *See*—
Fulmer, Leon F., Sr.; and Lewis, John R., Jr., 4,097,870, Cl. 343-792.000.
Shannon, Robert Day, to Du Pont de Nemours, E. I., and Company. $Na_5GdSi_4O_{12}$ and related rare earth sodium ion conductors and electrolytic cells therefrom. 4,097,345, Cl. 204-59.0AM.
Shansky, Albert, to Del Laboratories, Inc. Nail polish. 4,097,589, Cl. 424-61.000.
Shapiro, Jonathan S.; Berluti, Vincent, Jr.; Pellegrino, Anthony; and Wagner, Howard G., to Machlett Laboratories, Inc., The. X-ray testing system. 4,097,793, Cl. 324-20.00R.
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Shaw, Hugh E., Jr., to PPG Industries, Inc. Method of and apparatus for locating B type and point type defects in a glass ribbon. 4,097,151, Cl. 356-73.000.
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Sheahan, Michael H., to Rothmans of Pall Mall Canada Limited. Bundling of cigarettes. 4,096,682, Cl. 53-149.000.
Shelby, Robert L.; Duke, James T.; and Parker, Duane L., to Caterpillar Tractor Co. Track guiding means for a track-type vehicle. 4,097,093, Cl. 305-22.000.
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McLaughlin, William A.; and Richardson, Edwin A., 4,096,914, Cl. 166-307.000.
Shelstad, Richard J. Self-cleaning filter assembly. 4,097,379, Cl. 210-167.000.
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Shergov, Igor Vladimirovich; and Melbard, Sergei Nikolaevich. Thermionic heater cathode assembly of electron-beam gun. 4,097,714, Cl. 219-121.0EB.

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Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Dezawa, Shin-ichiro, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,097,650, Cl. 428-336.000.
Shirasaka, Kaname; Nakagami, Yoshihiro; Tomiyori, Takashi; Ikemoto, Masanori; and Shaura, Tsuneo, to Mitsuboshi Belting Ltd. Method for manufacturing bias fabric. 4,097,621, Cl. 427-173.000.
Shishkin, Oleg Petrovich: *See*—
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Shue, Robert S., to Phillips Petroleum Company. Process for preparing polyamides of PACP. 4,097,469, Cl. 260-78.00R.
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Sibley, Henry C., to General Signal Corporation. Fail-safe solid state logic. 4,097,764, Cl. 307-200.00A.
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Siegrist, Adolf Emil; and Coviello, Vincenzo, to CIBA-GEIGY Corporation. Process for the manufacture of cyano-substituted stilbene compounds. 4,097,515, Cl. 260-465.00G.
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Breuninger, Karl; Haberland, Detlef; and Herberger, Roland, 4,097,685, Cl. 174-68.500.
Jenik, Franz, 4,097,768, Cl. 307-230.000.
Mahlein, Hans; and Rauscher, Walter, 4,097,126, Cl. 350-295.000.
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Silver, Stanley Milton. Plant watering system and process. 4,096,663, Cl. 47-80.000.
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Simon, Artur; Sarosi, Gyula; Keszler, Balazs; Toth, Attila; and Rethy, Maria, to Muanyagipari Kutato Intezet. Process for preparing copolymers of elastomeric properties from olefinic monomers. 4,097,658, Cl. 526-143.000.
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Simpson, Howard D., to Union Oil Company of California. Desulfurization process and catalyst. 4,097,413, Cl. 252-465.000.
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Simpson, Robert E., to United States of America, Interior. Cartridge for grouting an anchor element in a hole of a support structure. 4,096,944, Cl. 206-219.000.
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Marsh, Walter H. W., 4,096,811, Cl. 112-77.000.
Peters, David L.; and Marr, Philip R., Sr., 4,097,154, Cl. 356-152.000.
Peters, David L., 4,097,901, Cl. 358-223.000.
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Sircar, Jagadish C.; Kesten, Stephen J.; and Zinnes, Harold, to Warner-Lambert Company. 5,6-Dihydro-4-oxo-4H-thieno[2,3-b]thiopyran-5-carboxamides. 4,097,441, Cl. 260-332.20A.
Siwak, Eugeniusz; Krainski, Andrzej; Lendzion, Krzysztof; and Wewior, Jerzy, to Warszawskie Zaklady Mechaniczne PZL-WZM. Fuel injector. 4,096,998, Cl. 239-533.300.
Six, Lyle D., to Garrett Corporation, The. Low cost, high temperature turbine wheel and method of making the same. 4,097,276, Cl. 75-208.00R.
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Pastor, Stephen D.; Skoultchi, Martin M.; and Hernandez, Henry R., 4,097,417, Cl. 252-501.000.
Slattery, Gerald Holmes, to FMC Corporation. Preparation of peracetic acid by oxidation of acetaldehyde. 4,097,520, Cl. 260-502.00A.
Sleger, Roger R., to Ampex Corporation. Web transport system. 4,097,005, Cl. 242-189.000.
Sloan, Betty Jeanne. Foot jewelry. 4,096,710, Cl. 63-2.000.
Sloan Valve Company: *See*—
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Smith, David B.; and Benson, James A., to Physio-Control Corporation. Portable electronic physiological instrument having separable first and second components, and improved mechanical connector therefor. 4,096,856, Cl. 128-4.19D.
Smith, Horace L., Jr., to Smitherm Industries, Inc. Continuous coffee roasting apparatus. 4,096,792, Cl. 99-355.000.
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Societe d'Etudes de Machines Thermiques S.E.M.T.: *See—*
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Societe Lignes Telegraphiques et Telephoniques: *See—*
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Societe Nationale Industrielle Aerospatiale: *See—*
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Pardo, Pierre; and Pruvot, Francois, 4,096,766, Cl. 74-640.000.

Sohde, Takeshi; Gotoh, Astuko; Iwamoto, Kuniharu; and Okamoto, Yasushi, to Nippi, Incorporated. Method for preparing dispersion of collagen fiber. 4,097,234, Cl. 8-94.190.

Solem, Philip M. Device for identifying and locating a star in the heavens. 4,096,646, Cl. 35-43.000.

Soler, Norman V.; and DeSisto, Richard E., to General Signal Corporation. Hair blower with orifice control. 4,097,722, Cl. 219-368.000.

Solitron Devices, Inc.: *See—*
Adams, Guy, 4,096,852, Cl. 128-2.00H.

Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, to Sankyo Company, Limited; and CIBA-GEIGY Corporation. 1,3,8-Triazaspiro[4.5]decane-2,4-dione polymer stabilizers. 4,097,587, Cl. 260-45.80A.

Sorensen, Frede: *See—*
Larsson, Lars-Goran; and Sorensen, Frede, 4,097,787, Cl. 318-332.000.

Sorokin, Vladimir Konstantinovich: *See—*
Rivkin, Ilya Yakovlevich; Aisin, Shamil Mustafovich; Garkusha, Olga Ivanovna; Dondoshansky, Alexandr Lvovich; Zellis, Evgeny Alfredovich; Karpov, Vladilen Efremovich; Sorokin, Vladimir Konstantinovich; and Shishkin, Oleg Petrovich, 4,096,745, Cl. 73-194.00B.

Southwest Research Institute: *See—*
Melton, Rosser B., Jr.; and Hubbard, Elbert M., 4,096,945, Cl. 206-469.000.

Southwire Company: *See—*
Bonnamour, Yves Bernard, 4,096,906, Cl. 164-433.000.

Spang Industries, Inc.: *See—*
Goldman, Alex; and Laing, Alfred M., 4,097,392, Cl. 252-62.620.

Speakman, John Gabriel, to British Petroleum Company Limited, The. Preparation of titanium containing catalyst on magnesium support material. 4,097,409, Cl. 252-429.00R.

Spears, George B. Water injection system for internal combustion engines. 4,096,829, Cl. 123-25.00J.

Spencer, Edward M., to I-T-E Industries Ltd. Interface for high voltage oil-filled and gas-filled apparatus. 4,097,681, Cl. 174-12.00R.

Sperry Rand Corporation: *See—*
Brackbill, Warren H.; and Ostergren, William F., 4,097,001, Cl. 239-658.000.

Spider Staging, Inc.: *See—*
Fisher, Harry S., 4,096,922, Cl. 182-36.000.

Spiegel, Raymond William, to Whirlpool Corporation. Dishwasher rack supporting and adjusting apparatus. 4,097,099, Cl. 312-311.000.

Spiegel, Willi: *See—*
Lessnig, Werner; Metz, Gunter; Spiegel, Willi; and Fleischer, Jurgen, 4,096,965, Cl. 220-20.000.

Spong, Fred William, to RCA Corporation. Multilayer optical record. 4,097,895, Cl. 358-128.000.

Sprecker, Mark A.: *See—*
Hall, John B.; Sprecker, Mark A.; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; and Novak, Robert M., 4,097,416, Cl. 252-522.000.

Spring, Ferdinand E.: *See—*
DeLauder, William R.; and Spring, Ferdinand E., 4,097,613, Cl. 426-303.000.

Springer, Barry R. Camera testing methods and apparatus. 4,096,732, Cl. 73-5.000.

Springer, Joseph E., Sr. Connecting bracket arrangement for towing lawn mower. 4,097,059, Cl. 280-204.000.

SRI International: *See—*
Green, Philip S., 4,097,835, Cl. 340-1.00R.

Stabilus GmbH: *See—*
Wirges, Winfried, 4,096,785, Cl. 91-416.000.

Stach, Leonard J.: *See—*
Hotz, Roger D.; Stach, Leonard J.; and Richter, Sidney B., 4,097,491, Cl. 260-340.700.

Stade, Elwood H. Orienting device for dental facebow or pantograph. 4,096,637, Cl. 33-174.00D.

Stahl, Michael. Automatic multi nail dispenser. 4,096,982, Cl. 227-113.000.

Stahlecker, Fritz; and Raasch, Hans, to Stahlecker, Fritz; and Stahlecker, Hans. Feed device for open-end spinning assembly. 4,096,686, Cl. 57-58.950.

Stahlecker, Hans: *See—*
Stahlecker, Fritz; and Raasch, Hans, 4,096,686, Cl. 57-58.950.

Stamicarbon, N.V.: *See—*
Creemers, Henricus M. J. C.; Graff, Renier J. L.; and Verschoor, Hendrinus M., 4,097,659, Cl. 526-151.000.

Standard Oil Company: *See—*
Dolhyj, Serge R.; Milberger, Ernest C.; and Evans, Sandra R., 4,097,501, Cl. 260-346.740.
Hengstebeck, Robert J., 4,097,544, Cl. 260-683.00R.

Standard Oil Company (Indiana): *See—*
Caspari, Gunter, 4,097,387, Cl. 252-47.500.

Stanford Research Institute: *See—*
Robinson, Lloyd A., 4,097,869, Cl. 343-773.000.

Stange, Klaus K., to Xerox Corporation. Magnetic brush development system for flexible photoreceptors. 4,096,826, Cl. 118-656.000.

Stanley Electric Co., Ltd.: *See—*
Okazaki, Kunio, 4,097,700, Cl. 200-61.270.

Station Service-Textile F. Calemard et Cie S.A.: *See—*
Calemard, Philipe, 4,097,327, Cl. 156-515.000.

Stauffer Chemical Company: *See—*
Fancher, Llewellyn W., 4,097,605, Cl. 424-322.000.
Gallagher, Ruth E.; and Goswami, Jagadish C., 4,097,663, Cl. 526-278.000.
Kuhn, Leroy B., 4,097,558, Cl. 260-899.000.
Lam, Hsiao-Ling; and Pallos, Ferenc M., 4,097,512, Cl. 260-453.0RW.

Stava, Reid J., to Singer Company, The. Latch for film cartridge. 4,097,166, Cl. 403-321.000.

Stearns, Joseph A.: *See—*
Goodrich, Stanley R., Jr.; Skolnik, David J.; Stearns, Joseph A.; Farrell, Robert C.; Brezinski, Richard R.; and Parks, Robert R., 4,097,057, Cl. 280-96.100.

Steele Chemicals Co. Ltd.: *See—*
Kruger, Gunther, 4,097,477, Cl. 260-239.570.

Steen, Donald B., to United States of America, Navy. Coaxial polarity reversing switch with rotary actuation. 4,097,701, Cl. 200-153.00S.

Stefano, Gene E.; and Tally, David N., to Gates Rubber Company, The. Halogenated butyl interlayer for reinforced elastomeric hose articles. 4,096,888, Cl. 138-125.000.

Stein, Larry: *See—*
Sarantakis, Dimitrios; and Stein, Larry, 4,097,471, Cl. 260-112.50R.

Steinberg, Sidney: *See—*
Auerbach, Albert A.; and Steinberg, Sidney, 4,096,865, Cl. 128-419.0PT.

Steinberger, Joseph, to Paul Forkardt Kommanditgesellschaft. High speed power chuck. 4,097,053, Cl. 279-1.00C.

Steinel, Winfried: *See—*
Sandau, Hartmut; Weigert, Wilhelm; Steinel, Winfried; Kraisel, August; Ritter, Klaus; Gaub, Erwin; and Kochendorfer, Heinrich, 4,096,787, Cl. 92-260.000.

Stella, Carl; and Simon, David Julian, to Singer Company, The. Digital to analog resolver converter. 4,097,858, Cl. 340-347.0SY.

Stemme, Otto; Lermann, Peter; and Ehgartner, Gabriele, to AGFA-Gevaert AG. Cinematographic camera. 4,097,133, Cl. 352-243.000.

Stephan, Norbert: *See—*
Uhlmann, Otto; and Stephan, Norbert, 4,096,726, Cl. 72-291.000.

Stephens Industries, Inc.: *See—*
Pugh, Gary L.; and Rowlett, Glenford, 4,097,040, Cl. 271-104.000.

Stephenson, Robert Larry, to Allied Chemical Corporation. Ferrule buckle with sliding release button. 4,096,606, Cl. 24-230.00A.

Sternstein, Sanford S. Materials testing device. 4,096,741, Cl. 73-90.000.

Stewart, Robert A. Core sampling device. 4,096,749, Cl. 73-425.200.

Stobb, Inc.: *See—*
Stobb, Walter John, 4,096,958, Cl. 214-152.000.

Stobb, Walter John, to Stobb, Inc. Method for handling bundles of sheets. 4,096,958, Cl. 214-152.000.

Stock, Hermann, to Hermann Stock, Firma. Autoclave and autoclave system. 4,097,235, Cl. 21-93.000.

Stock, Horst; and Ellbrunner, Adalbert, to Wacker-Chemitronic Gesellschaft fur Elektronik Grundstoffe mbH. Process for the production of monocrystalline silicon rods. 4,097,329, Cl. 156-617.0SP.

Stolle Corporation, The: *See—*
Kaminski, Elton George, 4,096,967, Cl. 220-269.000.

Stoner, Jesse A., to General Electric Company. Method of introducing hardenable material into containing means therefor. 4,096,905, Cl. 164-51.000.

Stonner, Hans-Martin; and Wiesner, Paul, to Metallgesellschaft Aktiengesellschaft. Process of scrubbing polyhydroxy phenols from gas. 4,097,539, Cl. 568-751.000.

Stouffer, Richard C.; and Schotthoefer, Jerome W., to Allied Chemical Corporation. Constant pull safety belt retracting mechanism. 4,097,003, Cl. 242-107.000.

Strandberg, Per, to Kockums Automation AB. Method of, and device for effecting contact-free measurement by optical scanning. 4,097,159, Cl. 356-167.000.

Strandtoft, Benny: *See—*
Nygaard, Nils Hansson; Nielsen, Kaj; and Strandtoft, Benny, 4,097,788, Cl. 318-415.000.

Straszewski, Klaus: *See—*
Anderka, Gerold; Hampel, Horst; Jozat, Walter; and Straszewski, Klaus, 4,097,874, Cl. 346-140.00R.

Stratienko, Andrew. Thrust collar. 4,097,167, Cl. 403-374.000.

Streit, Kenneth F., to Phone-Ducs, Inc. Multibore conduit. 4,096,887, Cl. 138-117.000.

Strelow, Horst, to Siemens Aktiengesellschaft. Digital data computer processing system. 4,096,990, Cl. 235-307.000.

Strike, Donald P.; and Kao, Wen-Ling, to American Home Products Corporation. Prostaglandin derivatives. 4,097,514, Cl. 260-464.000.
Stromberg-Carlson Corporation: *See—*
Niertit, Frank, 4,096,839, Cl. 123-139.0AW.
Strop, Petr: *See—*
Mikes, Otakar; Strop, Petr; and Coupek, Jiri, 4,097,420, Cl. 260-2.10R.
Stupay, Lawrence J.: *See—*
Furey, Robert J.; and Stupay, Lawrence J., 4,097,104, Cl. 339-74.00R.
Sturm, Ronald L.: *See—*
Withers, Stanley J.; and Sturm, Ronald L., 4,096,751, Cl. 73-425.600.
Sturm, Ronald Leo, to Oxford Laboratories Inc. Hand-held micropipettor with fluid transfer volume adjustment mechanism. 4,096,750, Cl. 73-425.600.
Sudo, Toshihisa: *See—*
Takahashi, Eikichi; Taguchi, Toshihiko; Fujikura, Kazuo; and Sudo, Toshihisa, 4,097,266, Cl. 75-0.50R.
Sugimoto, Masahiro: *See—*
Nara, Takashi; Okachi, Ryo; Yamamoto, Mitsuyoshi; Mori, Yasuki; Sato, Moriyuki; Sugimoto, Masahiro; and Shimizu, Yoshiaki, 4,097,428, Cl. 260-345.90R.
Sugiura, Akio: *See—*
Nojiri, Tadao; and Sugiura, Akio, 4,096,992, Cl. 235-462.000.
Sullivan, Francis J., Jr.: *See—*
Jerinic, George; Thoren, Glenn R.; Sullivan, Francis J., Jr.; and Lampen, James L., 4,097,823, Cl. 332-9.00R.
Sumitomo Durez Company, Ltd.: *See—*
Nakamura, Masayuki; and Sanuki, Setsuo, 4,097,443, Cl. 260-38.000.
Sumitomo Electric Industries, Ltd.: *See—*
Kumamaru, Hiroyuki; Shioyama, Hiromu; and Hoshikawa, Masao, 4,097,119. Cl. 350-96.230.
Sumitomo Metal Industries, Ltd.: *See—*
Kano, Yasunao, 4,096,725, Cl. 72-250.000.
Summers, Frank C., to Coil Sales & Manufacturing Co. Terminal housing for buried electrical cables and method of expanding same. 4,097,683, Cl. 174-38.000.
Sunak, Harish Ram Dass: *See—*
Selway, Peter Richard; Chown, Martin; Epworth, Richard Edward; Leggett, Norman Derek; and Sunak, Harish Ram Dass, 4,097,891, Cl. 357-81.000.
Sundstrand Corporation: *See—*
Baits, Stephen S., 4,097,200, Cl. 417-302.000.
Schauer, George A., 4,096,786, Cl. 91-499.000.
Sussman, Howard. Plant-watering device. 4,097,020, Cl. 251-10.000.
Suzuki, Akiyoshi, to Canon Kabushiki Kaisha. Image forming optical system. 4,097,125, Cl. 350-294.000.
Suzuki, Kanekichi: *See—*
Ishii, Ryoichi; Sakurai, Yoshishige; Yamada, Hiroshi; Uchida, Kuniharu; and Suzuki, Kanekichi, 4,096,757, Cl. 73-621.000.
Suzuki, Katsuyasu; Morita, Yoshitoshi; and Morita, Motoo, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Morita Iron Works Co., Ltd. Method and apparatus for automatically forming wire frames. 4,096,891, Cl. 140-1.000.
Suzuki, Kohji; and Tagawa, Kazuaki, to Ricoh Company, Ltd. Method and apparatus for cleaning toner in electrophotographic copying machines. 4,097,140, Cl. 355-15.000.
Suzuki, Masaaki: *See—*
Shirahata, Ryuji; Kitamoto, Tatsuji; Suzuki, Masaaki; and Dezawa, Shin-ichiro, 4,097,650, Cl. 428-336.000.
Suzuki, Takao: *See—*
Yamawaki, Masao; Aoki, Katsuo; Oka, Yoshio; Suzuki, Takao; Ina, Osamu; and Hara, Kunihiko, 4,096,822, Cl. 118-48.000.
Svec, Alexander: *See—*
Wackenreuther, Helmut; and Svec, Alexander, 4,097,076, Cl. 285-340.000.
Sweet, Charles R., to Bendix Corporation, The. Circuit for frequency modulated fuel injection system. 4,096,833, Cl. 123-32.0EA.
Sweet, David L.: *See—*
Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 4,097,034, Cl. 267-15.00A.
Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., to American Carrier Equipment, Inc. Air-ride suspension system. 4,097,034, Cl. 267-15.00A.
Swinkels, Godefridus M.; Milner, Edward F. G.; and Genik-Sas-Berezowsky, Roman Michael, to Cominco Ltd.; and Sherritt Gordon Mines Limited. Hydrometallurgical process for recovering copper and other metal values from metal sulphides. 4,097,271, Cl. 75-104.000.
Swiss Aluminium Ltd.: *See—*
Michel, Jean, 4,097,027, Cl. 266-44.000.
Syntex Corporation: *See—*
Fried, John H.; and Harrison, Ian T., 4,097,674, Cl. 560-100.000.
Syntex (U.S.A.) Inc.: *See—*
Muchowski, Joseph Martin; and Kluge, Arthur Frederick, 4,097,579, Cl. 424-274.000.
Systems Research Laboratories, Inc.: *See—*
Dehait, Jack T., 4,097,158, Cl. 356-160.000.
Taylor, Francis M., 4,097,849, Cl. 340-213.00Q.
Szabo, Francis S.: *See—*
Scholten, Frank L.; and Szabo, Francis S., 4,097,875, Cl. 354-8.000.
Tachikawa, Shiro: *See—*
Murakami, Masuo; Takahashi, Kozo; Hirata, Yasufumi; Takashima, Mutsuo; Iwanami, Sumio; Hasegawa, Osamu; Nozaki, Yoshihisa; Tachikawa, Shiro; Takeda, Masaaki; and Usuda, Shinji, 4,097,487, Cl. 260-326.850.
Tack, Albert; and Gabel, Friedrich, to Tack & Gabel, Firma. Door lock for automotive vehicle. 4,097,078, Cl. 292-216.000.
Tack & Gabel, Firma: *See—*
Tack, Albert; and Gabel, Friedrich, 4,097,078, Cl. 292-216.000.
Tagawa, Kazuaki: *See—*
Suzuki, Kohji; and Tagawa, Kazuaki, 4,097,140, Cl. 355-15.000.
Taguchi, Toshihiko: *See—*
Takahashi, Eikichi; Taguchi, Toshihiko; Fujikura, Kazuo; and Sudo, Toshihisa, 4,097,266, Cl. 75-0.50R.
Taisei Kensetsu Kabushiki Kaisha & Tokyo Gas Co., Ltd.: *See—*
Murayama, Takao; Shimizu, Seiichi; and Miyakawa, Takeo, 4,097,251, Cl. 55-97.000.
Takacs, Joseph E.: *See—*
Takacs, Victor C.; and Takacs, Joseph E., 4,096,613, Cl. 407-92.000.
Takacs, Victor C.; and Takacs, Joseph E., to Triangle Grinding, Inc. Cutting tool. 4,096,613, Cl. 407-92.000.
Takahashi, Eikichi; Taguchi, Toshihiko; Fujikura, Kazuo; and Sudo, Toshihisa, to Senju Metal Industry Co., Ltd. Microsphere of solder having a metallic core and production thereof. 4,097,266, Cl. 75-0.50R.
Takahashi, Haruo: *See—*
Muramatsu, Tateo; Fukai, Toshio; and Takahashi, Haruo, 4,096,700, Cl. 61-1.00F.
Takahashi, Kozo: *See—*
Murakami, Masuo; Takahashi, Kozo; Hirata, Yasufumi; Takashima, Mutsuo; Iwanami, Sumio; Hasegawa, Osamu; Nozaki, Yoshihisa; Tachikawa, Shiro; Takeda, Masaaki; and Usuda, Shinji, 4,097,487, Cl. 260-326.850.
Takahashi, Masaoki; and Fumishi, Michio, to Nippon Kayaku Co., Ltd. Basic dye composition. 4,097,233, Cl. 8-83.000.
Takahata, Hideyo: *See—*
Yataki, Masamichi; Takahata, Hideyo; and Simomura, Norio, 4,097,160, Cl. 356-237.000.
Takao, Hiroshi: *See—*
Kishida, Katsuhiro; Takao, Hiroshi; Togawa, Kimmochi; and Matoba, Kazuo, 4,097,353, Cl. 204-195.00S.
Takao, Hiroyuki: *See—*
Asahara, Nakaba; Takao, Hiroyuki; and Yasue, Kenji, 4,097,431, Cl. 260-22.00R.
Takasaki, Yoshitaka: *See—*
Ishizuka, Kohei; Kita, Yasuhiro; Takasaki, Yoshitaka; and Nakagawa, Junichi, 4,097,824, Cl. 333-28.00R.
Takashima, Mutsuo: *See—*
Murakami, Masuo; Takahashi, Kozo; Hirata, Yasufumi; Takashima, Mutsuo; Iwanami, Sumio; Hasegawa, Osamu; Nozaki, Yoshihisa; Tachikawa, Shiro; Takeda, Masaaki; and Usuda, Shinji, 4,097,487, Cl. 260-326.850.
Takasu, Yoshio; and Kondo, Eiichi, to Canon Kabushiki Kaisha. Photosensitive member having layer of vinyl carbazole polymer containing antimony chalcogen compound of antimony and sulfur. 4,097,277, Cl. 96-1.50R.
Takatsu, Suehiro. Shock absorber. 4,096,927, Cl. 188-268.000.
Takayama, Masami: *See—*
Koike, Wataro; Takayama, Masami; Ohashi, Hideaki; and Matsui, Sadayoshi, 4,097,426, Cl. 260-2.5AM.
Takeda, Masaaki: *See—*
Murakami, Masuo; Takahashi, Kozo; Hirata, Yasufumi; Takashima, Mutsuo; Iwanami, Sumio; Hasegawa, Osamu; Nozaki, Yoshihisa; Tachikawa, Shiro; Takeda, Masaaki; and Usuda, Shinji, 4,097,487, Cl. 260-326.850.
Talbot, Robert Eric: *See—*
Cubbon, Robert Charles Patrick; Russell, Peter John; Talbot, Robert Eric; and Woodbridge, David Thomas, 4,097,536, Cl. 260-610.00R.
Tally, David N.: *See—*
Stefano, Gene E.; and Tally, David N., 4,096,888, Cl. 138-125.000.
Tamao, Yoshikuni: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,097,591, Cl. 424-177.000.
Tamao, Yoshikuno: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,097,472, Cl. 424-177.000.
Tamborski, Christ: *See—*
Snyder, Carl E., Jr.; and Tamborski, Christ, 4,097,388, Cl. 252-49.900.
Tamura, Masaru: *See—*
Mizutani, Hiroshi; Tamura, Masaru; and Saegusa, Katsumi, 4,097,397, Cl. 252-153.000.
Tamura, Takaaki; Fujita, Norihiko; Matsuura, Chihiro; Ito, Wataru; and Negishi, Naoki, to Kogyo Kaihatsu Kenkyusho (Industrial Research Institut). Reduction catalyst for removal of nitrogen oxides in exhaust gas. 4,097,576, Cl. 423-239.00A.
Tanaka, Akira; and Yoshida, Akio, to Mitsubishi Paper Mills, Ltd. Direct-positive photographic silver halide emulsion containing novel dye. 4,097,285, Cl. 96-132.000.
Tanaka, Eizi; Ohashi, Michihiro; Mochizuki, Hiroshi; and Nishimatsu, Akira, to Nippon Soken, Inc. Fuel control system for an internal combustion engine. 4,096,838, Cl. 123-139.0AW.
Tanaka, Tsunemitsu; Nakagawa, Tetsuo; Abiko, Shiro; and Kaneko, Norio, to Mitsubishi Petrochemical Company Limited; and Chiyoda Chemical Engineering & Construction. Method for preventing the

formation of coke deposits in a fluidized bed reactor. 4,097,366, Cl. 208-127.000.

Tani, Tadaaki, to Fuji Photo Film Co., Ltd. Method for supersensitizing silver halide photographic emulsions. 4,097,284, Cl. 96-126.000.

Tanner Electronics Systems Technology, Inc.: *See—*
Tanner, James L.; Rist, Bruno A.; Sanchez, George; and Becht, Balazs, 4,097,894, Cl. 358-118.000.

Tanner, James L.; Rist, Bruno A.; Sanchez, George; and Becht, Balazs, to Tanner Electronics Systems Technology, Inc. Secured scramble decoder filter. 4,097,894, Cl. 358-118.000.

Tanner, Randall Curtis, to Cincinnati Milacron Inc. Method and apparatus for modifying the position of a machine slide to compensate for different following errors. 4,096,770, Cl. 82-1.00C.

Tardiff, Victor H., to Tru-Eze Manufacturing Co., Inc. Table with leaf and locking system. 4,097,037, Cl. 269-323.000.

Tauer, Miroslav, to Siemens Aktiengesellschaft. Liquid-crystal display with bistable cholesteric liquid-crystal layer and method of making the same. 4,097,121, Cl. 350-333.000.

Tawfik, David A., to Bendix Corporation, The. Monitoring apparatus for redundant control systems. 4,096,989, Cl. 235-307.000.

Taylor, Francis M., to Systems Research Laboratories, Inc. Electronic comparator for process control. 4,097,849, Cl. 340-213.00Q.

Taylor, George, to British Steel Corporation. Cleaning coke oven doors. 4,097,304, Cl. 134-6.000.

Taylor, Robert E. Wheel jack apparatus. 4,097,022, Cl. 254-133.00R.

Taylor, William P. Portable refrigeration machine. 4,096,707, Cl. 62-167.000.

TDK Electronics Co., Ltd.: *See—*
Tokuoka, Yasumichi; Fukuda, Kazumasa; and Hosaka, Akihiko, 4,097,313, Cl. 148-105.000.

Technica-Guss GmbH: *See—*
Krall, Heribert A.; and Maag, Helmut, 4,096,907, Cl. 164-448.000.

Technicon Instruments Corporation: *See—*
Oberhardt, Bruce J.; and Olich, Jack, 4,097,237, Cl. 23-230.00B.

Tecumseh Products Company: *See—*
Farr, James B., 4,097,754, Cl. 310-67.00R.
Wolf, Rudolf H., 4,097,185, Cl. 415-88.000.

Teige, Wolfgang; and Schickfluss, Rudolf, to Hoechst Aktiengesellschaft. Process for the dyeing of water-insoluble thermoplastic polymers and polycondensates in the mass. 4,097,444, Cl. 260-40.00P.

Teika Seiyaku Kabushiki Kaisha: *See—*
Kanaoka, Yuichi, 4,097,488, Cl. 260-326.50C.

Tektronix, Inc.: *See—*
Olson, David Harmon; and Berg, Eldon Carl, 4,097,798, Cl. 324-78.00D.

Tellesbo, Ola: *See—*
Evensen, Harald Thiis; and Tellesbo, Ola, 4,097,644, Cl. 428-281.000.

Tenex Corporation: *See—*
Cheris, Albert B.; and Frye, Lonnie E., 4,097,628, Cl. 428-43.000.

Tenneco Chemicals, Inc.: *See—*
Keyworth, Donald A.; Di Bella, Eugene P.; and Rosen, Marvin, 4,097,451, Cl. 260-45.70R.

Tennent, Richard Lee, to Grafalloy Corporation. Construction for a fiber reinforced shaft. 4,097,626, Cl. 428-36.000.

Teramura, Hiroichi: *See—*
Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,097,903, Cl. 358-261.000.

Terhune, James H.: *See—*
Neissel, John P.; Hendon, Harry H.; and Terhune, James H., 4,097,330, Cl. 176-19.00R.

Texaco Development Corp.: *See—*
Cavitt, Stanley B., 4,097,414, Cl. 252-476.000.

Texas Gas Transmission Corporation: *See—*
Gomberg, Henry J., 4,097,348, Cl. 204-157.10H.

Texas Instruments Incorporated: *See—*
Bellavance, David W., 4,097,819, Cl. 331-94.50H.
Bickel, Samuel H., 4,097,708, Cl. 219-10.55R.

Textron Inc.: *See—*
Rieth, Kurt Albert, 4,096,688, Cl. 59-79.00R.

Tezuka, Tohru: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,097,472, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,097,591, Cl. 424-177.000.

Theard, Leslie P.: *See—*
Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., 4,097,448, Cl. 260-42.180.
Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., 4,097,449, Cl. 260-42.180.

Thiele, Geraldine H., to Oxford Hill, Ltd. Method of treating and controlling gingivitis. 4,097,604, Cl. 424-318.000.

Thiokol Corporation: *See—*
Bertozzi, Eugene Ribello, 4,097,299, Cl. 106-287.320.

Thomas, Richard E.: *See—*
Loria, Adrian M.; and Thomas, Richard E., 4,097,637, Cl. 428-212.000.

Thomas, Walter B., III; and Welker, Christopher H., to Corning Glass Works. Low-temperature devitrifiable sealing composition. 4,097,296, Cl. 106-53.000.

Thompson, David A.: *See—*
Mazzeo, Nickolas Joseph; and Thompson, David A., 4,097,802, Cl. 324-252.000.

Thompson, Richard G. Propulsion unit for skiers. 4,096,919, Cl. 180-6.00R.

Thompson, Robert W., to Westinghouse Electric Corp. Elastomer belt impregnated with carbon for testing dielectric adequacy and for indicating physical defects in a nonconducting material. 4,097,795, Cl. 324-54.000.

Thomsen, Jorgen Thyrsted, to J. P. Schmidt Jun. A/S. Method of cutting wrappers for tobacco products and cutting table for carrying out said method. 4,096,775, Cl. 83-511.000.

Thomson-CSF: *See—*
Monvoisin, Jacques, 4,097,748, Cl. 250-505.000.
Moulin, Michel; and Munier, Bernard, 4,097,900, Cl. 358-213.000.
Moutou, Paul Cyril; Hareng, Michel; and Le Berre, Serge, 4,097,142, Cl. 355-45.000.

Thoren, Glenn R.; Lampen, James L.; and Jerinic, George, to Raytheon Company. Cylindrical cavity power combiner for plurality of coaxial oscillators. 4,097,817, Cl. 331-56.000.

Thoren, Glenn R.: *See—*
Jerinic, George; Thoren, Glenn R.; Sullivan, Francis J., Jr.; and Lampen, James L., 4,097,823, Cl. 332-9.00R.
Lampen, James L.; Jerinic, George; and Thoren, Glenn R., 4,097,821, Cl. 331-101.000.

Thorson, Eric K., to Eldec Corporation. Electrical indicator including relatively translatable scale and index tapes. 4,097,799, Cl. 324-99.00R.

Tideland Signal Corporation: *See—*
Klein, William Richard; Kotila, Carl Leroy; and Krams, Ira Leslie, 4,097,308, Cl. 136-89.00H.

Tiefenbach, Joseph P.: *See—*
Sieglaff, Charles L.; Hora, Charles J.; and Tiefenbach, Joseph P., 4,097,657, Cl. 526-30.000.

Tiemann, Jerome J.: *See—*
Baertsch, Richard D.; and Tiemann, Jerome J., 4,097,886, Cl. 357-24.000.

Toa Electric Company, Ltd.: *See—*
Miyazaki, Masami, 4,097,694, Cl. 179-15.0AT.

Todd, Maurice Cornelius: *See—*
Agers, Brian Michael; and Todd, Maurice Cornelius, 4,096,612, Cl. 28-272.000.

Togawa, Kimmochi: *See—*
Kishida, Katsuhiro; Takao, Hiroshi; Togawa, Kimmochi; and Matoba, Kazuo, 4,097,353, Cl. 204-195.00S.

Tohei Ototani: *See—*
Ototani, Tohei; and Kataura, Yasuji, 4,097,268, Cl. 75-57.000.

Tokai Denka Kogyo Kabushiki Kaisha: *See—*
Sato, Kanji, 4,097,478, Cl. 544-353.000.

Tokuno, Masateru, to Rengo Kabushiki Kaisha. Conveyor system for a cutter for a web of corrugated fiberboard. 4,096,941, Cl. 198-689.000.

Tokuoka, Yasumichi; Fukuda, Kazumasa; and Hosaka, Akihiko, to TDK Electronics Co., Ltd. Method of recovery of ferromagnetic metal or alloy particles by using a magnetic drum. 4,097,313, Cl. 148-105.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Ishii, Ryoichi; Sakurai, Yoshishige; Yamada, Hiroshi; Uchida, Kuniharu; and Suzuki, Kanekichi, 4,096,757, Cl. 73-621.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Komeya, Katsutoshi; and Inoue, Hiroshi, 4,097,293, Cl. 106-43.000.
Matsumoto, Shoichi; Kawamoto, Masahiro; and Mizunoya, Kiyoshi, 4,097,128, Cl. 350-335.000.

Tom McGuane Industries, Inc.: *See—*
Ludwig, George, 4,097,778, Cl. 315-82.000.

Tomioka, Shinji; and Mori, Yasuki, to Abbott Laboratories. Derivatives of an antibiotic XK-62-2. 4,097,664, Cl. 536-17.000.

Tomiyori, Takashi: *See—*
Shirasaka, Kaname; Nakagami, Yoshihiro; Tomiyori, Takashi; Ikemoto, Masanori; and Shaura, Tsuneo, 4,097,621, Cl. 427-173.000.

Tomizawa, Yoshio: *See—*
Satoh, Ken; and Tomizawa, Yoshio, 4,097,726, Cl. 235-92.0MP.

Tonnelli, Gerald J., to Production Data Inc. Oil well logging probe assembly. 4,096,752, Cl. 73-431.000.

Tonomura, Shinji: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,097,472, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,097,591, Cl. 424-177.000.

Toray Industries, Inc.: *See—*
Kusakabe, Haruhiko; Makita, Masashi; and Ueda, Masutoshi, 4,096,890, Cl. 139-435.000.

Toray Silicone Company, Ltd.: *See—*
Hasegawa, Yoshiyuki, 4,097,643, Cl. 428-270.000.

Torio Kabushiki Kaisha: *See—*
Fujii, Motoyuki; Yokota, Koji; and Yashita, Hajime, 4,097,805, Cl. 325-17.000.

Torralba, Jose Estaban. Roll-type thread cutting die. 4,096,722, Cl. 72-104.000.

Torrington Company, The: *See—*
Lopes, Antone, Jr.; and Shepard, Richard Wilton, 4,096,713, Cl. 66-121.000.

Toshiba Chemical Products Co. Ltd.: *See—*
Akiyama, Keiichi; Kamiuchi, Junichi; Matsuda, Itsuo; and Fujii, Takara, 4,097,545, Cl. 260-830.00P.

Toth, Attila: *See—*
Simon, Artur; Sarosi, Gyula; Keszler, Balazs; Toth, Attila; and Rethy, Maria, 4,097,658, Cl. 526-143.000.
Toulios, Peter P.: *See—*
Knox, Robert M.; and Toulios, Peter P., 4,097,826, Cl. 333-73.00R.
Tout, John R. Self placing automatic form. 4,097,173, Cl. 404-98.000.
Touval, Irving: *See—*
Littman, Stanley; and Touval, Irving, 4,097,560, Cl. 260-931.000.
Towmotor Corporation: *See—*
Bivens, Ward L.; and Schwehr, Richard A., 4,097,791, Cl. 318-484.000.
Toyama, Kunio; Shimizu, Isamu; Imamura, Takeo; and Nakanishi, Atsuo, to Asahi-Dow Limited. PPO-Graft copolymer and process for producing the same. 4,097,556, Cl. 260-886.000.
Toyo Kogyo Co., Ltd.: *See—*
Kakui, Kuniaki, 4,097,207, Cl. 418-83.000.
Satou, Haruhiko; Honiden, Yoshinori; Hayashida, Motoyuki; and Wakamoto, Mutsuo, 4,096,828, Cl. 123-209.000.
Toyoda, Takashi; Miyabe, Yoshio; and Yamanaka, Masaaki, to Oji Yuka Goseishi Kabushiki Kaisha. Synthetic paper having good ink adhesion thereto. 4,097,645, Cl. 428-306.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Nohira, Hidetaka; Bessho, Hironori; and Sakai, Yasuyuki, 4,096,691, Cl. 60-295.000.
Otsuka, Katsumi; Ishigami, Noriakira; and Kozakai, Asao, 4,097,841, Cl. 340-52.00C.
Suzuki, Katsuyasu; Morita, Yoshitoshi; and Morita, Motoo, 4,096,891, Cl. 140-1.000.
Tozzi, Antonio; and Cassandrini, Paolo, to Chimosa Chimica Organica S.p.A. Benzophenone base stabilizing agent for polymers and polymers stabilized thereby. 4,097,454, Cl. 260-45.75N.
Tracy, Chester Edwin: *See—*
Kern, Werner; and Tracy, Chester Edwin, 4,097,889, Cl. 357-54.000.
Tranberg, Erik Rudolf, to GKN-Stenman AB. Arrangement in door-locks. 4,096,719, Cl. 70-450.000.
Trapido, Leonard: *See—*
Perline, Irving W.; Trapido, Leonard; Rottenkolber, John J.; and Rottenkolber, Michael L., 4,096,618, Cl. 29-278.000.
Treiber, Fritz F.; and Graham, Francis E., to Hobart Corporation. Door mounting and actuator for a pressure vessel. 4,096,968, Cl. 220-314.000.
Treuil, Bernard, to Societe d'Etudes de Machines Thermiques S.E.M.T. Method and means for conditioning the intake air of a supercharged, low-compression ratio diesel engine. 4,096,697, Cl. 60-599.000.
Treuner, Uwe D.: *See—*
Breuer, Hermann; and Treuner, Uwe D., 4,097,670, Cl. 544-27.000.
Triangle Grinding, Inc.: *See—*
Takacs, Victor C.; and Takacs, Joseph E., 4,096,613, Cl. 407-92.000.
Trickel, Lorn L. Method and apparatus for burning air-suspended particulate fuel. 4,096,808, Cl. 110-244.000.
Triebel, Wolfgang, to Polysius, AG. Apparatus for heat exchange between fine material and gas. 4,096,642, Cl. 34-57.00R.
Troster, Helmut: *See—*
Papenfuhs, Theodor; and Troster, Helmut, 4,097,450, Cl. 260-42.210.
Troyer, Lloyd E.: *See—*
Minogue, Robert W.; and Troyer, Lloyd E., 4,097,632, Cl. 428-130.000.
Tru-Eze Manufacturing Co., Inc.: *See—*
Tardiff, Victor H., 4,097,037, Cl. 269-323.000.
True Temper Corporation: *See—*
Groth, Hugh F., 4,096,915, Cl. 172-42.000.
Trushell, James Bryce: *See—*
Lamoureux, William Roger; and Trushell, James Bryce, 4,097,856, Cl. 340-324.00M.
TRW Inc.: *See—*
Kwieraga, James A., 4,097,180, Cl. 408-154.000.
Tsuboi, Makoto: *See—*
Kobayashi, Tetsu; Kanazawa, Takato; and Tsuboi, Makoto, 4,097,707, Cl. 219-10.55B.
Tsuji, Hisao: *See—*
Kitazawa, Yoichi; Sato, Takeshi; and Tsuji, Hisao, 4,096,899, Cl. 152-354.00R.
Tsukagoshi, Shigeru: *See—*
Ishida, Torao; Akiyama, Minoru; Nishimura, Daikichi; Hayashi, Hiroshi; Sakurai, Yoshio; and Tsukagoshi, Shigeru, 4,097,665, Cl. 536-23.000.
Tsukamoto, Yutaka: *See—*
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,096,692, Cl. 60-307.000.
Tsukiji, Yoshihiro, to Kabushiki Kaisha Komatsu Seisakusho. Machine for drilling holes in right-angular work surfaces. 4,097,175, Cl. 408-23.000.
Tsuruoka, Masao: *See—*
Umemura, Sumio; Ohdan, Kyoji; Uda, Taizo; Matsuzaki, Tokuo; Hidaka, Mikio; Nakamura, Yasuo; and Tsuruoka, Masao, 4,097,518, Cl. 260-465.300.
Tsuto, Keiichi; Majima, Kanji; and Imamura, Shigeyasu, to Kao Soap Co., Ltd. Sulfonation apparatus. 4,097,242, Cl. 23-283.000.
Tsutsumi, Hisao; Hayashi, Shizuo; Nakayama, Hirokazu; and Ukena, Toshinao, to Kao Soap Co., Ltd. Oil-in-water emulsion and emulsifying or solubilizing agent composition useful therein. 4,097,403, Cl. 252-312.000.
Tsypin, Nekhemian Veniaminovich: *See—*
Bakul, Valentin Nikolaevich; Bilyk, Igor Ivanovich; Bronshtein, Dolores Khaimovna; Vovchanovsky, Ivan Fedorovich; and Tsypin, Nekhemian Veniaminovich, 4,097,274, Cl. 75-201.000.
Tung, Ker-Kong: *See—*
Pierre, Kenneth J.; Tung, Ker-Kong; and Nadj, Henriette, 4,097,336, Cl. 195-99.000.
Tung, Marvin: *See—*
Powrie, William Duncan; and Tung, Marvin, 4,097,612, Cl. 426-269.000.
Turowski, Lawrence Edward: *See—*
Lunn, Norman Laurence; McCrea, Charles Jeffrey; Pregaman, Raymond David; and Turowski, Lawrence Edward, 4,097,625, Cl. 427-360.000.
Tyee Aircraft, Inc.: *See—*
Dubuque, Douglas K., 4,097,163, Cl. 403-274.000.
Tyke, Charlie R.: *See—*
Anderson, William C.; Cooper, Gordon J.; and Tyke, Charlie R., 4,097,918, Cl. 362-147.000.
Ucciani, Claude M.: *See—*
Becuwe, Alain G.; Senet, Jean-Pierre G.; and Ucciani, Claude M., 4,097,513, Cl. 260-453.0PH.
Uchida, Kuniharu: *See—*
Ishii, Ryoichi; Sakurai, Yoshishige; Yamada, Hiroshi; Uchida, Kuniharu; and Suzuki, Kanekichi, 4,096,757, Cl. 73-621.000.
Uda, Taizo: *See—*
Umemura, Sumio; Ohdan, Kyoji; Uda, Taizo; Matsuzaki, Tokuo; Hidaka, Mikio; Nakamura, Yasuo; and Tsuruoka, Masao, 4,097,518, Cl. 260-465.300.
Ueda, Masutoshi: *See—*
Kusakabe, Haruhiko; Makita, Masashi; and Ueda, Masutoshi, 4,096,890, Cl. 139-435.000.
Uehlinger, Werner; and Wendelspiess, Pius, to KM-Engineering AG. Method and a means for transferring articles, in particular semimanufactured articles or workpieces, between stations on machinery for working these articles mechanically. 4,096,731, Cl. 72-405.000.
Ueno, Hideyo: *See—*
Shimokawa, Hayao; Nakamuri, Makoto; Ueno, Hideyo; Namiki, Isamu; and Shiina, Naonori, 4,097,319, Cl. 156-79.000.
Uhlmann, Otto; and Stephan, Norbert, to Marshall Richards Barcro Limited. Method and apparatus for drawing tubes. 4,096,726, Cl. 72-291.000.
Uhtenwoldt, Herbert R.; Humes, Norman S.; and Crossman, Richard E., to Cincinnati Milacron-Heald Corp. Internal grinding machine. 4,096,667, Cl. 51-99.000.
Ukena, Toshinao: *See—*
Tsutsumi, Hisao; Hayashi, Shizuo; Nakayama, Hirokazu; and Ukena, Toshinao, 4,097,403, Cl. 252-312.000.
Ulch, Bryan D., to A-T-O Inc. Circuit for controlling automatic off-line operation of an on-line card reader. 4,097,727, Cl. 235-382.000.
Ullman, Myron E., Jr. Fabric identification tag. 4,096,655, Cl. 40-2.00R.
Ulrich, Otho E., to Armstrong Machine Works. Condensate controller. 4,096,876, Cl. 137-185.000.
Umemura, Sumio; Ohdan, Kyoji; Uda, Taizo; Matsuzaki, Tokuo; Hidaka, Mikio; Nakamura, Yasuo; and Tsuruoka, Masao, to Produits Chimiques Ugine Kuhlmann. Method for the catalytic production of acrylonitrile. 4,097,518, Cl. 260-465.300.
Union Carbide Corporation: *See—*
Chan, John Kai-Fai, 4,097,526, Cl. 260-566.0AC.
Cupper, Robert Alton; and Shiffler, Richard Welty, 4,097,393, Cl. 252-78.300.
Papa, Anthony Joseph; and Runyan, Walter Warren, 4,097,559, Cl. 260-928.000.
Piper, John, 4,097,916, Cl. 361-433.000.
Union Oil Company of California: *See—*
Simpson, Howard D., 4,097,413, Cl. 252-465.000.
Ward, John W., 4,097,365, Cl. 208-111.000.
Uniroyal, Inc.: *See—*
Brewer, Arthur D.; and Davis, Robert A., 4,097,580, Cl. 424-277.000.
Uniroyal Ltd.: *See—*
Brewer, Arthur D.; and Davis, Robert A., 4,097,580, Cl. 424-277.000.
United States Bedding Company, The: *See—*
Eide, Richard H.; and Golembeck, Gerald A., 4,096,595, Cl. 5-345.00R.
United States of America
Air Force: *See—*
Allinikov, Sidney, 4,097,776, Cl. 313-502.000.
Bilsbury, Stephen J., 4,096,804, Cl. 102-66.000.
Frost, William F.; Masak, Raymond J.; Baurle, Herbert F.; and Kowalski, Anthony F., 4,097,866, Cl. 343-100.0LE.
Snyder, Carl E., Jr.; and Tamborski, Christ, 4,097,388, Cl. 252-49.900.
Williams, Mark R., 4,097,827, Cl. 333-81.00R.
Army: *See—*
Borowick, John Joseph, 4,097,868, Cl. 343-727.000.
Fagan, James J.; Otto, William F.; and McKnight, William B., 4,097,007, Cl. 244-3.110.
Guazzoni, Guido Eddardo, 4,097,654, Cl. 429-5.000.
Huskins, Chester W., 4,097,662, Cl. 526-217.000.
Kesting, Lawrence W., 4,096,803, Cl. 102-49.500.
Kuchmas, John, Jr.; and Bubb, Gary E., 4,097,800, Cl. 324-178.000.
Miner, Mark S.; and Crickman, Charles W., 4,096,805, Cl. 102-214.000.

Energy: *See*—
Anderson, James B., 4,097,247, Cl. 55-17.000.
Betten, Paul R., 4,097,331, Cl. 176-81.000.
Lewis, Arthur E.; and Mallon, Richard G., 4,096,912, Cl. 166-259.000.
Interior: *See*—
Black, Sigmund; and Finney, James L., 4,097,854, Cl. 340-282.000.
Simpson, Robert E., 4,096,944, Cl. 206-219.000.
National Aeronautics and Space Administration: *See*—
Barack, William N.; Gay, Charles H., Jr.; Beckman, Stephen W.; and Domas, Paul A., 4,097,194, Cl. 416-244.00A.
Navy: *See*—
Clavell, Cesar, Jr., 4,097,680, Cl. 174-8.000.
Gardner, Keith L., 4,097,749, Cl. 250-550.000.
Jones, Gerald N., 4,097,865, Cl. 343-18.00E.
Rice, Roy W.; Wynne, Kenneth J.; and Fox, William B., 4,097,294, Cl. 106-43.000.
Schnur, Joel M.; Miller, Richard S.; Sheridan, James P.; and Britt, A. D., 4,097,317, Cl. 149-7.000.
Steen, Donald B., 4,097,701, Cl. 200-153.00S.
Vito, John L.; and Mesecar, Roderick S., 4,097,922, Cl. 364-443.000.
Waln, Garry L., 4,096,802, Cl. 102-49.500.
Wameling, Richard F., 4,096,818, Cl. 114-311.000.

U.S. Philips Corporation: *See*—
Eckhardt, Friedhelm, 4,096,604, Cl. 16-128.100.
Gerlach, Gijsbertus; and Kelly, John Joseph, 4,097,394, Cl. 252-79.500.
Greefkes, Johannes Anton, 4,097,693, Cl. 179-15.0AT.
Kowalski, Gunter, 4,097,747, Cl. 250-445.00T.
vanderVeen, Jan; and Hegge, Theodorus Cornelis Jozef Maria, 4,097,120, Cl. 350-350.000.

United States Steel Corporation: *See*—
Auger, Robert G.; and Restelli, Edward F., Jr., 4,097,574, Cl. 423-74.000.
Dunshee, Robert S., 4,097,713, Cl. 219-121.00P.
Martin, Wayne A., 4,096,730, Cl. 72-352.000.

Unitika Ltd.: *See*—
Asahara, Nakaba; Takao, Hiroyuki; and Yasue, Kenji, 4,097,431, Cl. 260-22.00R.

University of Toronto, The Governing Council of the: *See*—
Caley, William F.; and Flengas, Spero N., 4,097,351, Cl. 204-181.00N.

University of Virginia: *See*—
Schladitz, Hermann J., 4,096,823, Cl. 118-48.000.
Schladitz, Hermann J., 4,097,624, Cl. 427-251.000.

Uno, Naoyuki; and Miyata, Katsuhiko, to Asahi Kogaku Kogyo Kabushiki Kaisha. Dual-mode light meter system for SLR camera using beam-splitting reflex mirror. 4,097,876, Cl. 354-31.000.

Unruh, Dale H., to Caterpillar Tractor Co. Roll stiffening and dampening in articulated vehicles. 4,097,060, Cl. 280-492.000.

UOP Inc.: *See*—
Bartholic, David B., 4,097,243, Cl. 23-288.00S.
Geske, Bruce R., 4,096,911, Cl. 166-234.000.
Hayes, John C., 4,097,368, Cl. 208-139.000.

Upjohn Company, The: *See*—
Axen, Udo F., 4,097,519, Cl. 560-53.000.
Bundy, Gordon L., 4,097,489, Cl. 260-326.270.
Bundy, Gordon L., 4,097,505, Cl. 260-413.000.
Bundy, Gordon L., 4,097,506, Cl. 260-413.000.
Bundy, Gordon L., 4,097,508, Cl. 260-413.000.
Moon, Malcolm W.; and Kornis, Gabriel, 4,097,672, Cl. 548-377.000.
Nelson, Norman A., 4,097,493, Cl. 260-343.30P.
Nelson, Norman A., 4,097,529, Cl. 260-586.00R.
Nelson, Norman A., 4,097,537, Cl. 568-807.000.
Pyke, Thomas R.; and Salmond, Marion P., 4,097,335, Cl. 195-51.00S.
Robert, Andre, 4,097,603, Cl. 424-305.000.
Yankee, Ernest W., 4,097,675, Cl. 560-121.000.

Upson Tools, Inc.: *See*—
Engel, Paul Richard, 4,096,896, Cl. 145-50.00B.

Urushizaki, Sakae. Tape cutter. 4,097,328, Cl. 156-523.000.

USM Corporation: *See*—
Monro, David Jan, 4,096,771, Cl. 82-35.000.

Usry, Gerald O., to General Electric Company. Fault detector for liquid immersed inductive apparatus. 4,097,852, Cl. 340-242.000.

Usuda, Shinji: *See*—
Murakami, Masuo; Takahashi, Kozo; Hirata, Yasufumi; Takashima, Mutsuo; Iwanami, Sumio; Hasegawa, Osamu; Nozaki, Yoshihisa; Tachikawa, Shiro; Takeda, Masaaki; and Usuda, Shinji, 4,097,487, Cl. 260-326.850.

Vagias, Ernest. String anchor replacement for repetition lever and jack in a piano action. 4,096,779, Cl. 84-239.000.

vanderVeen, Jan; and Hegge, Theodorus Cornelis Jozef Maria, to U.S. Philips Corporation. Liquid crystalline compounds and mixtures. 4,097,120, Cl. 350-350.000.

van Heijst, Willem Jan, to N. V. Industrieele Handelscombinatie Holland. Conduit with cardan joint. 4,097,072, Cl. 285-114.000.

Van House, Robert M., to General Motors Corporation. Vehicle power brake system with master booster and slave booster. 4,096,696, Cl. 60-547.000.

Van Houtte, Richard George, to Dresser Industries, Inc. Tapping sleeve for large size pipe. 4,097,073, Cl. 285-197.000.

Van Over, William Edward: *See*—
Beveridge, Wendell Hazelton, Jr.; and Van Over, William Edward, 4,096,754, Cl. 73-432.00R.

van Sorge, Bernardus J., to General Electric Company. Catalyst for preparation of ortho-alkylated phenols. 4,097,411, Cl. 252-457.000.

Varian Associates, Inc.: *See*—
Hill, Eugene F., 4,097,195, Cl. 417-49.000.
Patterson, Paul L., 4,097,239, Cl. 23-232.00R.

Veldman, Donald Richard; and Langdon, Howard S., to Langdon, Howard S. Tilting terminal clamp assembly. 4,097,112, Cl. 339-246.000.

Velsicol Chemical Corporation: *See*—
Hotz, Roger D.; Stach, Leonard J.; and Richter, Sidney B., 4,097,491, Cl. 260-340.700.
Krenzer, John; and Wu, Chin Ching, 4,097,485, Cl. 260-306.80D.
Krenzer, John, 4,097,486, Cl. 260-306.80D.
Smith, Ray E.; and Albright, James A., 4,097,641, Cl. 428-245.000.

Veneklasen, Lee H.: *See*—
Muller, Karl-Heinz; Rauch, Moriz V.; Krisch, Burkhard; and Veneklasen, Lee H., 4,097,739, Cl. 250-311.000.

Verderio, Giuseppe. Fire escape to be attached to the outside of a building. 4,096,923, Cl. 182-83.000.

Verschoor, Hendrinus M.: *See*—
Creemers, Henricus M. J. C.; Graff, Renier J. L.; and Verschoor, Hendrinus M., 4,097,659, Cl. 526-151.000.

Videen, Otis R., to Conwed Corporation. Selectively sorptive reinforced sheet. 4,097,638, Cl. 428-213.000.

Vinals, Joaquin: *See*—
Hall, John B.; Sprecker, Mark A.; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; and Novak, Robert M., 4,097,416, Cl. 252-522.000.

Viola, Thomas J., Jr.: *See*—
Morris, Raymond A.; and Viola, Thomas J., Jr., 4,097,890, Cl. 357-55.000.

Viscardi, Frank. Gear shift selector brake interlock. 4,096,930, Cl. 192-4.00A.

Vitatron Medical B.V.: *See*—
Renirie, Alexis C. M., 4,097,766, Cl. 307-229.000.

Vito, John L.; and Mesecar, Roderick S., to United States of America, Navy. Automatic real time navigation communicator. 4,097,922, Cl. 364-443.000.

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Watanabe, Rinzo; and Shimojima, Masatoshi, 4,097,124, Cl. 350-187.000.

Vlahakis, Eftichios Van. Toilet bowl dispenser. 4,096,593, Cl. 4-231.000.

Vlahakis, Eftichios Van. Drain opening method. 4,096,871, Cl. 134-40.000.

Vobecky, Paul: *See*—
Rhodes, Robin B.; and Vobecky, Paul, 4,096,723, Cl. 72-123.000.

Vock, Manfred Hugo: *See*—
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Vockenhuber, Karl: *See*—
Schild, Josef; Scheiber, Robert; Schmidt, Harald; Drasch, Josef; and Keznickl, Eduard, 4,097,906, Cl. 360-13.000.

Vogel, Charles G.: *See*—
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Vojik, Francis Michael: *See*—
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Volk, Heinrich: *See*—
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Papenfuhs, Theodor; and Volk, Heinrich, 4,097,510, Cl. 260-439.00R.

Volkswagenwerk Aktiengesellschaft: *See*—
Krafzig, Rolf; Langer, Paul; and Leppich, Erhard, 4,096,928, Cl. 188-282.000.

von Bonin, Wulf, to Bayer Aktiengesellschaft. Fire-proofing sealing elements. 4,097,385, Cl. 428-35.000.

Von Kamp, John: *See*—
Kulkarni, Mohan V.; and Von Kamp, John, 4,097,548, Cl. 260-873.000.

von Zelewsky, Alexander; Frey, Christoph; and L'Eplattenier, Francois, to Ciba-Geigy Corporation. Mixed complexes of methine dyes. 4,097,484, Cl. 260-299.000.

Vovchanovsky, Ivan Fedorovich: *See*—
Bakul, Valentin Nikolaevich; Bilyk, Igor Ivanovich; Bronshtein, Dolores Khaimovna; Vovchanovsky, Ivan Fedorovich; and Tsypin, Nekhemian Veniaminovich, 4,097,274, Cl. 75-201.000.

Vulcan Radiator Company, The: *See*—
Sand, Robert H., 4,097,720, Cl. 219-366.000.

Vyzkumny ustav vodohospodarsky: *See*—
Haindl, Karel, 4,097,026, Cl. 366-165.000.

Wachter, Rudolf Ludwig; and Edinger, Winfried Franz, to Permahop Hopfenpulver GmbH & Co. KG, Firma. Apparatus for cooling hops. 4,096,793, Cl. 99-467.000.

Wackenreuther, Helmut; and Svec, Alexander, to Oesterreichische Salen-Kunststoffwerk Gesellschaft m.b.H. Fitting piece for rigid or flexible tubes. 4,097,076, Cl. 285-340.000.

Wacker-Chemitronic Gesellschaft fur Elektronik Grundstoffe mbH: *See*—
Stock, Horst; and Ellbrunner, Adalbert, 4,097,329, Cl. 156-617.0SP.

Wada, Susumu: *See*—
Higuchi, Kousaku; Sato, Satoshi; and Wada, Susumu, 4,097,031, Cl. 266-226.000.

Wada, Tasaku, to Kokusai Denshin Denwa Co., Ltd. Optical read head. 4,097,904, Cl. 358-294.000.

Wadsworth Equipment Company: *See*—
McIntyre, Vernon E., 4,097,012, Cl. 248-23.000.

Waeschle Maschinenfabrik GmbH: *See*—
Krambrock, Wolfgang; Schwedes, Hansjorg; Richter, Wolfgang; and Elgeti, Klaus, 4,096,640, Cl. 34-10.000.

Wagner, Ferdinand: *See*—
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Wagner, Howard G.: *See*—
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Wahrenburg, Herbert L.: *See*—
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Wakahara, Yasushi: *See*—
Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,097,903, Cl. 358-261.000.

Wakamoto, Mutsuo: *See*—
Satou, Haruhiko; Honiden, Yoshinori; Hayashida, Motoyuki; and Wakamoto, Mutsuo, 4,096,828, Cl. 123-209.000.

Walker, Grant W., to Energy Absorption Systems, Inc. Method of forming a tubular container. 4,097,572, Cl. 264-310.000.

Wallace, Sydney Johnstone, to American Can Company. Article transport system. 4,096,937, Cl. 198-377.000.

Wallwey, Erich; Becker, Wolfgang; and Heldmann, Heinrich, to Wegmann & Co. Mounting for ammunition containers on rapid-fire gun mounts. 4,096,783, Cl. 89-34.000.

Waln, Garry L., to United States of America, Navy. Motion-induced stimuli initiation system. 4,096,802, Cl. 102-49.500.

Walsh, Lloyd R., to Fairchild Camera and Instrument Corp. Compact, two-phase charge-coupled-device structure utilizing multiple layers of conductive material. 4,097,885, Cl. 357-24.000.

Wameling, Richard F., to United States of America, Navy. Drogue type deceleration device. 4,096,818, Cl. 114-311.000.

Wang, Jish Min: *See*—
Berkowitz, Ami E.; Lahut, Joseph A.; and Wang, Jish Min, 4,097,871, Cl. 346-74.100.

Wang, Samuel Shang-Ning; and Lewellyn, Morris Eugene, to American Cyanamid Company. Composition for mineral concentrate dewatering during filtration. 4,097,390, Cl. 252-60.000.

Wanner, Karl; Reibetanz, Wilbert; Bleicher, Manfred; and Wiesner, Herbert, to Robert Bosch GmbH. Particle-aspirating accessory for a hammer drill. 4,097,176, Cl. 408-56.000.

Wapner, Herbert H.: *See*—
Kaplan, David; Brezack, Irving; Young, Nathan H., deceased; Kaplan, David, executor; Brezack, Irving, executor; and Wapner, Herbert H., 4,096,863, Cl. 128-349.00R.

Ward, John W., to Union Oil Company of California. Hydrocracking process and catalyst for production of middle distillate oils. 4,097,365, Cl. 208-111.000.

Ward, Richard Harry. Mat cutting machine. 4,096,631, Cl. 30-294.000.

Warner, David A. Optical objectives using apertured retrodirective reflectors. 4,097,141, Cl. 350-27.000.

Warner-Lambert Company: *See*—
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Warszawskie Zaklady Mechaniczne PZL-WZM: *See*—
Siwak, Eugeniusz; Krainski, Andrzej; Lendzion, Krzysztof; and Wewior, Jerzy, 4,096,998, Cl. 239-533.300.

Watanabe, Rinzo; and Shimojima, Masatoshi, to Vivitar Corporation. Zoom lens. 4,097,124, Cl. 350-187.000.

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Watanabe, Yuichi: *See*—
Nagao, Shozo; Iwamatsu, Junkichi; Kitsukawa, Hiroshi; Nishizaki, Kozo; Watanabe, Yuichi; and Okamoto, Yasunori, 4,097,074, Cl. 285-231.000.

Waters, William D., to Youngstown Sheet and Tube Company. Modified vinyl ester resin and pipe made therefrom. 4,097,569, Cl. 264-255.000.

Watson, Morris T.: *See*—
Harvey, John K., Jr.; Watson, Morris T.; Economy, Constantine F.; and LeFevre, Robert J., 4,096,893, Cl. 141-90.000.

Watts, Ronald E., to Minnesota Mining and Manufacturing Company. Particulate thickening agent. 4,097,405, Cl. 252-316.000.

Waukesha Bearings Corporation: *See*—
Gardner, Willis W., 4,097,094, Cl. 308-9.000.

Waverly Chemical Co.: *See*—
Moore, William Percy, Jr., 4,097,419, Cl. 260-2.50F.

Weatherly, Mark G., to Raymond Lee Organization, Inc., The, a part interest. Weather shelter. 4,096,874, Cl. 135-5.00R.

Weaver, William W.: *See*—
Anderson, Leroy E.; Schmidt, Michael P.; and Weaver, William W., 4,096,720, Cl. 72-50.000.

Webb, Jimmy L.: *See*—
Factor, Arnold; MacLaury, Michael R.; and Webb, Jimmy L., 4,097,538, Cl. 568-726.000.

Webb, Oswald, to GKN Transmissions Limited. Control couplings and gearing combined therewith. 4,096,712, Cl. 64-26.000.

Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the preparation of androstane-3,17-dione derivatives. 4,097,334, Cl. 195-51.00G.

Weber, Erich: *See*—
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Wegmann & Co.: *See*—
Wallwey, Erich; Becker, Wolfgang; and Heldmann, Heinrich, 4,096,783, Cl. 89-34.000.

Wegmuller, Hans; and Haase, Jaroslav, to CIBA-GEIGY Corporation. Process for the purification of industrial effluents. 4,097,376, Cl. 210-36.000.

Weidemann, Wolfgang: *See*—
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Weigand, Hanfried, to Hoechst Aktiengesellschaft. Device for the introduction of contrast medium into an anus praeter. 4,096,853, Cl. 128-2.00A.

Weigert, Wilhelm: *See*—
Sandau, Hartmut; Weigert, Wilhelm; Steinel, Winfried; Kraisel, August; Ritter, Klaus; Gaub, Erwin; and Kochendorfer, Heinrich, 4,096,787, Cl. 92-260.000.

Weiland, Emil: *See*—
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Weirauch, Kurt: *See*—
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Weise, Hans Joachim, to Braun Aktiengesellschaft. Device for heat treating hair on the human head, and the like hair curling device having self-regulating PTC heater. 4,097,718, Cl. 219-222.000.

Weiss, Hermann; and Wellkamp, Hans, to Atec-Weiss KG. Coupling with overload safety device. 4,097,161, Cl. 403-2.000.

Weiss, Verne E.; Campbell, Glenn M.; and Wilson, Gerald L., to General Mills, Inc. Apparatus for making a fried formed chip. 4,096,791, Cl. 99-353.000.

Weissel, Oskar: *See*—
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Weisz, Geraldine Fay. Methods and compositions for treatment of bacterial and fungus infections of the skin. 4,097,590, Cl. 424-151.000.

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Thomas, Walter B., III; and Welker, Christopher H., 4,097,296, Cl. 106-53.000.

Wellington, Charles K.; and Dakss, Mark L., to GTE Laboratories Incorporated. Coupling device for protectively jacketed fibers. 4,097,129, Cl. 350-96.150.

Wellkamp, Hans: *See*—
Weiss, Hermann; and Wellkamp, Hans, 4,097,161, Cl. 403-2.000.

Wendelspiess, Pius: *See*—
Uehlinger, Werner; and Wendelspiess, Pius, 4,096,731, Cl. 72-405.000.

WERSI-electronic GmbH & Co. Kommanditgesellschaft fur elektronische Bauelemente: *See*—
Dittmar, Wilfried, 4,096,778, Cl. 84-1.250.

West Electric Co., Ltd.: *See*—
Yoshino, Tsunemi, 4,097,880, Cl. 354-145.000.

West, Joe Edward. Liquid pressure intensifier. 4,097,197, Cl. 417-227.000.

West, Simon Michael, to Kraft Foods Limited. Method of removing bitter substances from brewers yeast and brewers yeast autolysates. 4,097,614, Cl. 426-422.000.

Western Electric Company, Inc.: *See*—
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Dafter, Robert Vincent, Jr., 4,097,286, Cl. 106-1.110.
Wyatt, Kenneth L., 4,096,970, Cl. 221-264.000.

Westinghouse Canada Limited: *See*—
Korta, John, 4,097,187, Cl. 415-161.000.

Westinghouse Electric Corp.: *See*—
Anderson, William C.; Cooper, Gordon J.; and Tyke, Charlie R., 4,097,918, Cl. 362-147.000.
Boundy, Bruce K., 4,097,014, Cl. 248-225.400.
Cohn, Marvin, 4,097,814, Cl. 330-286.000.
Greeneich, Edwin W.; and Escott, William S., 4,096,821, Cl. 118-10.000.
Koob, Robert W.; and Husson, Alan L., 4,096,925, Cl. 187-29.00R.
Thompson, Robert W., 4,097,795, Cl. 324-54.000.
Zitelli, William E., 4,096,699, Cl. 60-657.000.

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White Castle System, Inc.: *See*—
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White, Derek Graham Walter: *See*—
Curry, Harold George; Attwood, Brian William; White, Derek Graham Walter; Christensen, John Mosgaard; and Kroyer, Karl Kristian Kobs, 4,097,640, Cl. 428-219.000.

White, Herbert O. Wind motor. 4,097,190, Cl. 416-117.000.
White, Robert F., to General Motors Corporation. Engine mount. 4,097,011, Cl. 248-5.000.
Whitehead, Edwin Nelson. Process for preparing an identification card. 4,097,279, Cl. 96-27.00R.
Whitehurst, Gerald E., to Caterpillar Tractor Co. Modular steering clutch and brake package. 4,096,931, Cl. 192-18.00A.
Wicki, Heinz, to Sandoz Ltd. Trisazo dyes having a 2,7-(1-amino-3,6-or 4,6-disulfo-8-hydroxynaphthylene) radical. 4,097,476, Cl. 260-173.000.
Widmer, Ernst: *See—*
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Wildt, Hans-Achim Dietmar, to Du Pont de Nemours, E. I., and Company. Stable chloride process anatase slurries. 4,097,301, Cl. 106-300.000.
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Wilken, Judy. Surface covering with interwoven fabric strips. 4,097,631, Cl. 428-114.000.
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Wilson, David W.: *See—*
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Wilson, Francis P.; and Purcell, John E., to Perkin-Elmer Corporation, The. Flow controller-flow sensor assembly for gas chromatographs and the like. 4,096,746, Cl. 73-205.00R.
Wilson, Gerald L.: *See—*
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Wilson Jones Company: *See—*
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Wilson, Michael A.; Momparler, Fred J.; and Coleman, Kenneth, to Electro Corporation. Circuit for controllably providing power from an AC source to a load. 4,097,769, Cl. 307-252.00B.
Wilson, Robert J., to General Motors Corporation. Motor protector with remote temperature simulation. 4,097,790, Cl. 318-471.000.
Wirges, Winfried, to Stabilus GmbH. Elastic column of adjustable length. 4,096,785, Cl. 91-416.000.
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Withers, Stanley J.; and Sturm, Ronald L., to Oxford Laboratories Inc. Hand-held micropipettor with fluid transfer volume adjustment mechanism. 4,096,751, Cl. 73-425.600.
Witzke, Horst, to Optel Corporation; and Grumman Aerospace Corporation, part interest to each. Photogalvanic cell using a transparent conducting electrode. 4,097,655, Cl. 429-111.000.
Wolf, Rudolf H., to Tecumseh Products Company. Lubricating device. 4,097,185, Cl. 415-88.000.
Womack, John W., to Mobil Oil Corporation. Means and method for controlling excess air inflow. 4,097,218, Cl. 431-76.000.
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Woodward, Ernest F. Restraint shield. 4,096,807, Cl. 105-467.000.
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Wortmann, Joachim; Dany, Franz-Josef; and Kandler, Joachim, to Hoechst Aktiengesellschaft. Flameproof polyurethanes. 4,097,400, Cl. 252-182.000.
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Haas, Werner E. L.; and Dir, Gary A., 4,097,127, Cl. 350-332.000.
Hauser, Oscar G.; Meagher, Thomas; and Ruckdeschel, Frederick R., 4,097,139, Cl. 355-4.000.
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Yamada, Akitoshi; Goto, Toshiyuki; Kimura, Yoichi; and Kikuchi, Yoshinobu, to Matsushita Electric Industrial Co., Ltd. Out-of-head localization headphone listening device. 4,097,689, Cl. 179-1.00G.
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Yamawaki, Masao; Aoki, Katsuo; Oka, Yoshio; Suzuki, Takao; Ina, Osamu; and Hara, Kunihiko, to Nippondenso Co., Ltd. Gaseous atmosphere control apparatus for a semiconductor manufacturing system. 4,096,822, Cl. 118-48.000.
Yamazaki, Yasuhiro: *See—*
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Yang, Kang; Motz, Kaye L.; and Reedy, James D., to Continental Oil Company. Preparation of aldehydes from alcohols. 4,097,535, Cl. 260-603.00C.
Yankee, Ernest W., to Upjohn Company, The. 8β, 12α, 15β-$PGF_{2\alpha}$ Compounds. 4,097,675, Cl. 560-121.000.
Yano, Kazuhiko; Otsuki, Kazuhiko; and Ohashi, Ryota, to Kanzaki Kokyukoki Mfg. Co., Ltd. Control valve. 4,096,882, Cl. 137-596.120.
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Yataki, Masamichi; Takahata, Hideyo; and Simomura, Norio, to Canon

Kabushiki Kaisha. Method for inspecting object defection by light beam. 4,097,160, Cl. 356-237.000.
Yates, Dow. Chlorine generator. 4,097,356, Cl. 204-237.000.
Yazaki Sogyo Kabushiki Kaisha: *See*—
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Yevick, George J., to Izon Corporation. Microfiche having integral indexing means. 4,097,137, Cl. 353-120.000.
Yip, James K., to Eaton Corporation. Closed-center controller and neutral bypass arrangement therefor. 4,096,883, Cl. 137-596.130.
Yokota, Koji: *See*—
Fujii, Motoyuki; Yokota, Koji; and Yashita, Hajime, 4,097,805, Cl. 325-17.000.
Yoo, Jin S.: *See*—
Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,097,244, Cl. 44-1.00R.
Yoshida, Akio: *See*—
Tanaka, Akira; and Yoshida, Akio, 4,097,285, Cl. 96-132.000.
Yoshida, Minoru: *See*—
Morishima, Yukimas; Yoshida, Minoru; and Masuda, Hideo, 4,097,212, Cl. 425-313.000.
Yoshino, Tsunemi, to West Electric Co., Ltd. Photographic stroboscope. 4,097,880, Cl. 354-145.000.
Young, Douglas Leonard, to Canadian Ingersoll-Rand Co. Ltd. Screening apparatus hydrofoil. 4,097,374, Cl. 209-379.000.
Young, Jerry W., to Phillips Petroleum Company. Apparatus for forming a container side wall. 4,096,788, Cl. 93-39.00L.
Young, Nathan H., deceased: *See*—
Kaplan, David; Brezack, Irving; Young, Nathan H., deceased; Kaplan, David, executor; Brezack, Irving, executor; and Wapner, Herbert H., 4,096,863, Cl. 128-349.00R.
Youngstown Sheet and Tube Company: *See*—
Waters, William D., 4,097,569, Cl. 264-255.000.
Yu, John Pang, to RCA Corporation. Video record player switching system. 4,097,899, Cl. 358-181.000.
Yui, Hiroshi; Kakizaki, Tetsuji; Sano, Hironari; Arai, Masakazu; and Matsui, Hiroshi, to Mitsubishi Petrochemical Company Limited. Process for preparing novel polymer particles. 4,097,554, Cl. 260-878.00R.
Yuzawa, Haruo, to Nissan Motor Company, Limited. Altitude correction device of a carburetor. 4,097,563, Cl. 261-121.00B.
Zalar, David R.; and Hansen, James E., to Cutler-Hammer, Inc. Deceleration indication system. 4,097,842, Cl. 340-71.000.
Zappe, Hans Helmut, to International Business Machines Corporation. Electronically alterable non-latching Josephson AND, OR, NAND, NOR logic circuit. 4,097,765, Cl. 307-212.000.
Zaugg, Harold Elmer: *See*—
Horrom, Bruce Wayne; Minard, Frederick Nelson; and Zaugg, Harold Elmer, 4,097,597, Cl. 424-250.000.
Zellis, Evgeny Alfredovich: *See*—
Rivkin, Ilya Yakovlevich; Aisin, Shamil Mustafovich; Garkusha, Olga Ivanovna; Dondoshansky, Alexandr Lvovich; Zellis, Evgeny Alfredovich; Karpov, Vladilen Efremovich; Sorokin, Vladimir Konstantinovich; and Shishkin, Oleg Petrovich, 4,096,745, Cl. 73-194.00B.
Zellweger, Ltd.: *See*—
Felix, Ernst, 4,097,692, Cl. 179-2.50R.
Zemer, Yigael: *See*—
Nesher, Dan; and Zemer, Yigael, 4,096,644, Cl. 35-31.00R.
Zenith Radio Corporation: *See*—
Korpel, Adrianus, 4,097,730, Cl. 250-201.000.
Zenty, Stephen. Photochemical process for fossil fuel combustion products recovery and utilization. 4,097,349, Cl. 204-158.00R.
Zepernick, Dean E.: *See*—
Lemmon, John C.; Olson, Donald R.; and Zepernick, Dean E., 4,096,880, Cl. 137-454.200.
Ziegler, Joseph, to Pennsylvania Engineering Corporation. Enclosure for steel converting apparatus. 4,097,029, Cl. 266-142.000.
Zimmer, Aaron. Permanently lubricated bearing cartridge. 4,097,095, Cl. 308-20.000.
Zinnes, Harold: *See*—
Sircar, Jagadish C.; Kesten, Stephen J.; and Zinnes, Harold, 4,097,441, Cl. 260-332.20A.
Zitelli, William E., to Westinghouse Electric Corp. Auxiliary manual turbine controller. 4,096,699, Cl. 60-657.000.
Zumwalt, Floyd A. Harness for plug and socket. 4,097,105, Cl. 339-75.00P.
Zupancic, Joseph, to Weiner Steel Corporation. Baler for loose wire. 4,096,799, Cl. 100-215.000.
260: *See*—
Haaf, William Robert; Lee, Gim Fun, Jr.; 260; and 260, 4,097,550, Cl. 260-876.00B.
Haaf, William Robert; Lee, Gim Fun, Jr.; 260; and 260, 4,097,550, Cl. 260-876.00B.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF JUNE, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alberto-Culver Company: *See—*
Cella, John A.; and Schmitt, William H., Re. 29,682, Cl. 426-548.000.

Antonini, Frank P.; and Schwalbe, Julien I. Cauterizing instrument and holder. Re. 29,678, Cl. 206-571.000.

Boitnott, Boyd D., to Gray Tool Company. Stem sealing for high pressure valve or the like. Re. 29,679, Cl. 251-214.000.

Butterworth, Donald J.: *See—*
Salem, Eli; Butterworth, Donald J.; and Ryan, Leo F., Re. 29,680, Cl. 260-2.10R.

Cella, John A.; and Schmitt, William H., to Alberto-Culver Company. Low calorie dry sweetener composition. Re. 29,682, Cl. 426-548.000.

Diveley, William R., to Hercules Incorporated. Metal salts of 1,1,5,5-tetrasubstituted dithiobiurets. Re. 29,681, Cl. 260-429.900.

Ecodyne Corp.: *See—*
Salem, Eli; Butterworth, Donald J.; and Ryan, Leo F., Re. 29,680, Cl. 260-2.10R.

Foxboro Company, The: *See—*
Nabi, Saleh A., Re. 29,685, Cl. 364-900.000.

Gordon, Mack. Welding helmet with eye piece control. Re. 29,684, Cl. 219-147.000.

Gray Tool Company: *See—*
Boitnott, Boyd D., Re. 29,679, Cl. 251-214.000.

Hercules Incorporated: *See—*
Diveley, William R., Re. 29,681, Cl. 260-429.900.

Motorola, Inc.: *See—*
Ocken, Alfred, Jr., Re. 29,683, Cl. 174-52.0PE.

Nabi, Saleh A., to Foxboro Company, The. Process control system. Re. 29,685, Cl. 364-900.000.

Ocken, Alfred, Jr., to Motorola, Inc. Encapsulation housing for electronic circuit boards or the like and method of encapsulating. Re. 29,683, Cl. 174-52.0PE.

Ryan, Leo F.: *See—*
Salem, Eli; Butterworth, Donald J.; and Ryan, Leo F., Re. 29,680, Cl. 260-2.10R.

Salem, Eli; Butterworth, Donald J.; and Ryan, Leo F., to Ecodyne Corp. Regeneration of anion exchange resins. Re. 29,680, Cl. 260-2.10R.

Schmitt, William H.: *See—*
Cella, John A.; and Schmitt, William H., Re. 29,682, Cl. 426-548.000.

Schwalbe, Julien I.: *See—*
Antonini, Frank P.; and Schwalbe, Julien I., Re. 29,678, Cl. 206-571.000.

LIST OF PLANT PATENTEES

Darby, Robert H. Hibiscus plant named Lady Baltimore. 4,271, 6-27-78, Cl. 68.000.

Duffett, William E.: *See—*
Jessel, Walter H., Jr.; and Duffett, William E., 4,272, Cl. 74.000.
Jessel, Walter H., Jr.; and Duffett, William E., 4,273, Cl. 78.000.

Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,272, 6-27-78, Cl. 74.000.

Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,273, 6-27-78, Cl. 78.000.

Yoder Brothers, Inc.: *See—*
Jessel, Walter H., Jr.; and Duffett, William E., 4,272, Cl. 74.000.
Jessel, Walter H., Jr.; and Duffett, William E., 4,273, Cl. 78.000.

LIST OF DESIGN PATENTEES

Action Industries, Inc.: *See—*
Gensini, Franco, 248,329, Cl. D27-12.000.

American Standard Inc.: *See—*
Stichtenoth, Warren G., 248,318, Cl. D25-48.000.
Stichtenoth, Warren G., 248,319, Cl. D25-48.000.
Stichtenoth, Warren G., 248,320, Cl. D25-48.000.
Stichtenoth, Warren G., 248,321, Cl. D25-48.000.
Stichtenoth, Warren G., 248,322, Cl. D25-48.000.
Stichtenoth, Warren G., 248,323, Cl. D25-48.000.
Stichtenoth, Warren G., 248,324, Cl. D25-48.000.
Stichtenoth, Warren G., 248,325, Cl. D25-48.000.
Stichtenoth, Warren G., 248,326, Cl. D25-48.000.

Ampex Corporation: *See—*
Wilson, George A., 248,298, Cl. D14-41.000.

Bailey, Hester Caroline, beneficiary and devisee: *See—*
Bailey, Rex V., deceased; and Bailey, Hester Caroline, beneficiary and devisee, 248,332, Cl. D34-5.0MM.

Bailey, Rex V., deceased; and by Bailey, Hester Caroline, beneficiary and devisee. Combined domino holder and score counter. 248,332, 6-27-78, Cl. D34-5.0MM.

Barr, Josef J. Diamond ring. 248,285, 6-27-78, Cl. D11-27.000.

Barr, Josef J. Diamond ring. 248,286, 6-27-78, Cl. D11-34.000.

Blaisdell, Ronald G.; Hough, Harold L.; and Levin, Robert E., to GTE Sylvania Incorporated. Photochemotherapy chamber. 248,315, 6-27-78, Cl. D24-39.000.

Blaisdell, Ronald G.; and Hough, Harold L., to GTE Sylvania Incorporated. Modular photochemotherapy chamber. 248,316, 6-27-78, Cl. D24-39.000.

Boldt, Kurt Rolf. Vehicle trailer. 248,291, 6-27-78, Cl. D12-102.000.

Bond, Curtis J.: *See—*
Schieser, Warren J.; Sneeden, John R.; Feltner, R. Alan; and Bond, Curtis J., 248,281, Cl. D9-275.000.

Bowkley, Harry T.: *See—*
Ziegler, Ivan A.; Bowkley, Harry T.; and Fuller, Thaddeus W., 248,331, Cl. D34-5.00F.

Bowser, Donald C. Distress flag. 248,284, 6-27-78, Cl. D10-109.000.

Braun Aktiengesellschaft: *See—*
Rams, Dieter, 248,297, Cl. D14-34.000.

Bridgestone Tire Company Limited: *See—*
Hayakawa, Toshio; and Sakamoto, Takao, 248,293, Cl. D12-146.000.

Chromcraft Corporation: *See—*
Wilson, Robert L., 248,260, Cl. D6-63.000.

Coleman, Harry E. Kiosk. 248,264, 6-27-78, Cl. D6-149.000.

Comensoli, Leo John; and Smythe, Gloria Dawn, to Speeda Knitting Mills Pty. Ltd. Fabric. 248,339, 6-27-78, Cl. D92-1.0FF.

Cone, Richard E.: *See—*
Meeker, Paul K.; and Cone, Richard E., 248,317, Cl. D24-46.000.

Consumers Glass Company Limited: *See—*
Martin, Sam M., 248,280, Cl. D9-243.000.

Cooke, Donald R.; and Janssen, Robert I., to Padco, Inc. Paint pad bucket. 248,335, 6-27-78, Cl. D64-18.000.

Corco, Inc.: *See—*
Schieser, Warren J.; Sneeden, John R.; Feltner, R. Alan; and Bond, Curtis J., 248,281, Cl. D9-275.000.

Day, George E.; and Johnson, R. W. Automotive wheel. 248,295, 6-27-78, Cl. D12-206.000.

Deere & Company: *See—*
Grambush, Douglas Hood, 248,272, Cl. D8-307.000.

Denver Instrument Company: *See—*
Smith, James E., 248,282, Cl. D10-91.000.

Durban, John P. Garage door locking device. 248,273, 6-27-78, Cl. D8-331.000.

Eastman Kodak Company: *See*—
Hartman, Harlan Glenn; Flamini, Stephen James; and Rissberger, Arthur Christian, Jr., 248,277, Cl. D9-207.000.
Ehrenreich Photo-Optical Industries Inc.: *See*—
Pinchuk, Rene C., 248,306, Cl. D16-06.000.
Esunis, Constance: *See*—
Esunis, Raymond; and Esunis, Constance, 248,328, Cl. D25-78.000.
Esunis, Raymond; and Esunis, Constance. Post. 248,328, 6-27-78, Cl. D25-78.000.
Fairhope Fabrics, Inc.: *See*—
Gross, Irving; and Guillemette, Roger, 248,338, Cl. D92-1.0PP.
Family Jewels, Inc., The: *See*—
Sharp, Judy, 248,287, Cl. D11-83.000.
Feltner, R. Alan: *See*—
Schieser, Warren J.; Sneeden, John R.; Feltner, R. Alan; and Bond, Curtis J., 248,281, Cl. D9-275.000.
Fields, Robert. Table top. 248,268, 6-27-78, Cl. D6-193.000.
Fink, Albert William. Article carrying bag for attachment to a crutch. 248,336, 6-27-78, Cl. D87-1.00R.
Flamini, Stephen James: *See*—
Hartman, Harlan Glenn; Flamini, Stephen James; and Rissberger, Arthur Christian, Jr., 248,277, Cl. D9-207.000.
Fuller, Thaddeus W.: *See*—
Ziegler, Ivan A.; Bowkley, Harry T.; and Fuller, Thaddeus W., 248,331, Cl. D34-5.00F.
Gensini, Franco, to Action Industries, Inc. Smoking stand. 248,329, 6-27-78, Cl. D27-12.000.
Gersin, Robert P.: *See*—
Goldsmith, David; and Gersin, Robert P., 248,279, Cl. D9-222.000.
Gilb, Tyrell T., to Simpson Manufacturing Co., Inc. Joist hanger. 248,275, 6-27-78, Cl. D8-380.000.
Gillette Company, The: *See*—
Kitts, Keith D.; Hattori, Kenneth M.; and Stade, James H., 248,283, Cl. D10-106.000.
Gleaton, Robert Alan, to Motorola Inc. Control and display panel for radio receivers or the like. 248,301, 6-27-78, Cl. D14-76.000.
Goldsmith, David; and Gersin, Robert P., to Venture Foods Incorporation. Covered container. 248,279, 6-27-78, Cl. D9-222.000.
Grambush, Douglas Hood, to Deere & Company. Control lever knob. 248,272, 6-27-78, Cl. D8-307.000.
Gross, Irving; and Guillemette, Roger, to Fairhope Fabrics, Inc. Blanket fabric. 248,338, 6-27-78, Cl. D92-1.0PP.
GTE Sylvania Incorporated: *See*—
Blaisdell, Ronald G.; Hough, Harold L.; and Levin, Robert E., 248,315, Cl. D24-39.000.
Blaisdell, Ronald G.; and Hough, Harold L., 248,316, Cl. D24-39.000.
Guerette, Marcel, to Moody Si Ltd. Mobile ladder. 248,290, 6-27-78, Cl. D12-59.000.
Guillemette, Roger: *See*—
Gross, Irving; and Guillemette, Roger, 248,338, Cl. D92-1.0PP.
Hartman, Harlan Glenn; Flamini, Stephen James; and Rissberger, Arthur Christian, Jr., to Eastman Kodak Company. Container for toner powder. 248,277, 6-27-78, Cl. D9-207.000.
Hattori, Kenneth M.: *See*—
Kitts, Keith D.; Hattori, Kenneth M.; and Stade, James H., 248,283, Cl. D10-106.000.
Haugen, Donald. Animal litter box. 248,333, 6-27-78, Cl. D30-41.000.
Hayakawa, Toshio; and Sakamoto, Takao, to Bridgestone Tire Company Limited. Vehicle tire. 248,293, 6-27-78, Cl. D12-146.000.
Hayakawa, Toshio: *See*—
Maeda, Muneyoshi; Kojima, Hiroshi; and Hayakawa, Toshio, 248,292, Cl. D12-142.000.
Henry, George C. Tank valve. 248,313, 6-27-78, Cl. D23-19.000.
Hestehave, Borge. Gun sight. 248,310, 6-27-78, Cl. D22-8.000.
Hirasawa, Isamu; Mokudai, Hirokazu; and Kato, Osamu, to Kanda Tsushin Kogyo Co., Ltd. Telephone. 248,300, 6-27-78, Cl. D14-58.000.
Holden, Morell J., Jr., to Mobil Oil Corporation. Packaging tray or the like. 248,278, 6-27-78, Cl. D9-219.000.
Hough, Harold L.: *See*—
Blaisdell, Ronald G.; Hough, Harold L.; and Levin, Robert E., 248,315, Cl. D24-39.000.
Blaisdell, Ronald G.; and Hough, Harold L., 248,316, Cl. D24-39.000.
Janssen, Robert I.: *See*—
Cooke, Donald R.; and Janssen, Robert I., 248,335, Cl. D64-18.000.
Johnson, R. W.: *See*—
Day, George E.; and Johnson, R. W., 248,295, Cl. D12-206.000.
Kadota, Toshihiko, to Olympus Optical Co., Ltd. Tape recorder. 248,296, 6-27-78, Cl. D14-6.000.
Kanda Tsushin Kogyo Co., Ltd.: *See*—
Hirasawa, Isamu; Mokudai, Hirokazu; and Kato, Osamu, 248,300, Cl. D14-58.000.
Kanowsky Manufacturing, Inc.: *See*—
McCarthy, Richard, 248,261, Cl. D6-63.000.
Kato, Osamu: *See*—
Hirasawa, Isamu; Mokudai, Hirokazu; and Kato, Osamu, 248,300, Cl. D14-58.000.
Kavlick, Raymond P.: *See*—
Morgan, Samuel A.; and Kavlick, Raymond P., 248,299, Cl. D14-45.000.
Kingston, George W.; and Norcross, David R., to Timber Engineering Co. All purpose anchor. 248,274, 6-27-78, Cl. D8-354.000.
Kitts, Keith D.; Hattori, Kenneth M.; and Stade, James H., to Gillette Company, The. Smoke detector. 248,283, 6-27-78, Cl. D10-106.000.
Kojima, Hiroshi: *See*—
Maeda, Muneyoshi; Kojima, Hiroshi; and Hayakawa, Toshio, 248,292, Cl. D12-142.000.
Kola, Walter T. Stand for flowers or the like. 248,266, 6-27-78, Cl. D6-183.000.
Lande, Arnt, to WESTNOFA, West Norway Factories Ltd. A/S. Chair. 248,259, 6-27-78, Cl. D6-56.000.
Levin, Robert E.: *See*—
Blaisdell, Ronald G.; Hough, Harold L.; and Levin, Robert E., 248,315, Cl. D24-39.000.
Maeda, Muneyoshi; Kojima, Hiroshi; and Hayakawa, Toshio. Vehicle tire. 248,292, 6-27-78, Cl. D12-142.000.
Maguire, Paul R. Binocular. 248,307, 6-27-78, Cl. D16-59.000.
Maholias, Virginia A. Ornament or the like. 248,288, 6-27-78, Cl. D11-125.000.
Martin, Sam M., to Consumers Glass Company Limited. Produce container. 248,280, 6-27-78, Cl. D9-243.000.
Marx, Max. Carrying case for artists brushes. 248,337, 6-27-78, Cl. D87-1.00R.
McCarthy, Richard, to Kanowsky Manufacturing, Inc. Couch. 248,261, 6-27-78, Cl. D6-63.000.
McCord, Wilfred M., Jr.; and Varney, Boyko G., to Vermont American Corporation. Table for portable cutting tools. 248,304, 6-27-78, Cl. D15-127.000.
McCutchen, James E. Universal mount for a citizen band radio and tape player. 248,294, 6-27-78, Cl. D12-155.000.
McGee, Richard, III, to said Marcos Fastlicht, by said Richard McGee, III, a part interest to each. Combined cake and pie cutter. 248,271, 6-27-78, Cl. D7-142.000.
Meeker, Paul K.; and Cone, Richard E. Infant pacifier. 248,317, 6-27-78, Cl. D24-46.000.
Michaelson, Leonard: *See*—
Robichaud, Gary M., 248,262, Cl. D6-79.000.
Miller, Charles Eugene. Ornamental standard. 248,340, 6-27-78, Cl. D96-12.00A.
Mitchell, Patrick J. Display rack. 248,267, 6-27-78, Cl. D6-188.000.
Mobil Oil Corporation: *See*—
Holden, Morell J., Jr., 248,278, Cl. D9-219.000.
Mokudai, Hirokazu: *See*—
Hirasawa, Isamu; Mokudai, Hirokazu; and Kato, Osamu, 248,300, Cl. D14-58.000.
Moody Si Ltd.: *See*—
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Morgan, Samuel A.; and Kavlick, Raymond P., to Sycor, Inc. Housing for a data entry terminal. 248,299, 6-27-78, Cl. D14-45.000.
Motorola Inc.: *See*—
Gleaton, Robert Alan, 248,301, Cl. D14-76.000.
Munari, Frank, to Security Designs, a Div. of Munhill Corp. Ankle wallet or the like. 248,258, 6-27-78, Cl. D2-383.000.
Muskin Corporation: *See*—
Ziegler, Ivan A.; Bowkley, Harry T.; and Fuller, Thaddeus W., 248,331, Cl. D34-5.00F.
Norcross, David R.: *See*—
Kingston, George W.; and Norcross, David R., 248,274, Cl. D8-354.000.
O'Connor, David A., to Virginia National Bankshares, Inc. Check writing desk. 248,265, 6-27-78, Cl. D6-157.000.
Olympus Optical Co., Ltd.: *See*—
Kadota, Toshihiko, 248,296, Cl. D14-6.000.
Opitz, Nita M. Floating garden box. 248,289, 6-27-78, Cl. D11-156.000.
Padco, Inc.: *See*—
Cooke, Donald R.; and Janssen, Robert I., 248,335, Cl. D64-18.000.
Pearman, Fred E., Jr., to Singer Company, The. Canister vacuum cleaner or similar articles. 248,303, 6-27-78, Cl. D15-52.000.
Petit, Janet Wagner. Spatula. 248,270, 6-27-78, Cl. D7-102.000.
Pinchuk, Rene C., to Ehrenreich Photo-Optical Industries Inc. Camera. 248,306, 6-27-78, Cl. D16-06.000.
Pollano, Adele, executrix: *See*—
Pollano, Leo A., deceased; and Pollano, Adele, executrix, 248,256, Cl. D1-14.000.
Pollano, Leo A., deceased; and Pollano, Adele, executrix. Lasagna. 248,256, 6-27-78, Cl. D1-14.000.
Postma, Lesmeri-Anne M. Executive game indicator. 248,330, 6-27-78, Cl. D34-5.0MM.
Rams, Dieter, to Braun Aktiengesellschaft. Loud speaker. 248,297, 6-27-78, Cl. D14-34.000.
Raptis, George M. Fishing sinker. 248,311, 6-27-78, Cl. D22-30.000.
Renick, John A. Money belt. 248,257, 6-27-78, Cl. D2-380.000.
Richards, Theodore W. Binocular reflector telescope. 248,308, 6-27-78, Cl. D16-60.000.
Rissberger, Arthur Christian, Jr.: *See*—
Hartman, Harlan Glenn; Flamini, Stephen James; and Rissberger, Arthur Christian, Jr., 248,277, Cl. D9-207.000.
Robichaud, Gary M., to Michaelson, Leonard. Bed headboard. 248,262, 6-27-78, Cl. D6-79.000.
Romero, Charles L.: *See*—
Romero, Edward E.; and Romero, Charles L., 248,314, Cl. D24-25.000.
Romero, Edward E.; and Romero, Charles L. Vial holder and unit gauge for hypodermic syringes. 248,314, 6-27-78, Cl. D24-25.000.
Sakamoto, Takao: *See*—
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Salem China Company, The: *See*—
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Schieser, Warren J.; Sneeden, John R.; Feltner, R. Alan; and Bond,

Curtis J., to Corco, Inc. Dispensing value for a container. 248,281, 6-27-78, Cl. D9-275.000.
Schreckengost, Don, to Salem China Company, The. Ramekin. 248,269, 6-27-78, Cl. D7-28.000.
Schwartz, Dale R. Link unit for conveyor chain link assembly. 248,276, 6-27-78, Cl. D8-499.000.
Scott, Perry. Surveillance camera housing. 248,305, 6-27-78, Cl. D16-02.000.
Security Designs, a Div. of Munhill Corp.: *See*—
Munari, Frank, 248,258, Cl. D2-383.000.
Shape, Robert C., to Warren Steel Specialties Corp. Battery filling stand. 248,263, 6-27-78, Cl. D6-85.000.
Sharp, Judy, to Family Jewels, Inc., The. Jewelry charm. 248,287, 6-27-78, Cl. D11-83.000.
Simpson Manufacturing Co., Inc.: *See*—
Gilb, Tyrell T., 248,275, Cl. D8-380.000.
Singer Company, The: *See*—
Pearman, Fred E., Jr., 248,303, Cl. D15-52.000.
Smith, James E., to Denver Instrument Company. Electrical balance. 248,282, 6-27-78, Cl. D10-91.000.
Smythe, Gloria Dawn: *See*—
Comensoli, Leo John; and Smythe, Gloria Dawn, 248,339, Cl. D92-1.0FF.
Sneeden, John R.: *See*—
Schieser, Warren J.; Sneeden, John R.; Feltner, R. Alan; and Bond, Curtis J., 248,281, Cl. D9-275.000.
South, Donald A. Building trim. 248,327, 6-27-78, Cl. D25-74.000.
Speeda Knitting Mills Pty. Ltd.: *See*—
Comensoli, Leo John; and Smythe, Gloria Dawn, 248,339, Cl. D92-1.0FF.
Stade, James H.: *See*—
Kitts, Keith D.; Hattori, Kenneth M.; and Stade, James H., 248,283, Cl. D10-106.000.
Stello, Joseph. Protective cover for a piano. 248,334, 6-27-78, Cl. D56-1.00B.
Stichtenoth, Warren G., to American Standard Inc. Decorative door. 248,318, 6-27-78, Cl. D25-48.000.
Stichtenoth, Warren G., to American Standard Inc. Decorative door. 248,319, 6-27-78, Cl. D25-48.000.
Stichtenoth, Warren G., to American Standard Inc. Decorative door. 248,320, 6-27-78, Cl. D25-48.000.
Stichtenoth, Warren G., to American Standard Inc. Decorative door. 248,321, 6-27-78, Cl. D25-48.000.
Stichtenoth, Warren G., to American Standard Inc. Decorative door. 248,322, 6-27-78, Cl. D25-48.000.
Stichtenoth, Warren G., to American Standard Inc. Decorative door. 248,323, 6-27-78, Cl. D25-48.000.
Stichtenoth, Warren G., to American Standard Inc. Decorative door. 248,324, 6-27-78, Cl. D25-48.000.
Stichtenoth, Warren G., to American Standard Inc. Decorative door. 248,325, 6-27-78, Cl. D25-48.000.
Stichtenoth, Warren G., to American Standard Inc. Decorative door. 248,326, 6-27-78, Cl. D25-48.000.
Sycor, Inc.: *See*—
Morgan, Samuel A.; and Kavlick, Raymond P., 248,299, Cl. D14-45.000.
Timber Engineering Co.: *See*—
Kingston, George W.; and Norcross, David R., 248,274, Cl. D8-354.000.
Varney, Boyko G.: *See*—
McCord, Wilfred M., Jr.; and Varney, Boyko G., 248,304, Cl. D15-127.000.
Venture Foods Incorporation: *See*—
Goldsmith, David; and Gersin, Robert P., 248,279, Cl. D9-222.000.
Vermont American Corporation: *See*—
McCord, Wilfred M., Jr.; and Varney, Boyko G., 248,304, Cl. D15-127.000.
Virginia National Bankshares, Inc.: *See*—
O'Connor, David A., 248,265, Cl. D6-157.000.
Warren Steel Specialties Corp.: *See*—
Shape, Robert C., 248,263, Cl. D6-85.000.
Weast, Gerald T. Mount for telescopic sight. 248,309, 6-27-78, Cl. D22-7.000.
WESTNOFA, West Norway Factories Ltd. A/S: *See*—
Lande, Arnt, 248,259, Cl. D6-56.000.
Wilson, George A., to Ampex Corporation. Tape transport. 248,298, 6-27-78, Cl. D14-41.000.
Wilson, Robert L., to Chromcraft Corporation. Seat. 248,260, 6-27-78, Cl. D6-63.000.
Zatorski, John. Sprinkler system. 248,312, 6-27-78, Cl. D23-7.000.
Ziegler, Ivan A.; Bowkley, Harry T.; and Fuller, Thaddeus W., to Muskin Corporation. Splasher pool with slide and integral step. 248,331, 6-27-78, Cl. D34-5.00F.
Zoller, Richard D. Ground scraper for closing ditches and the like. 248,302, 6-27-78, Cl. D15-32.000.

CLASSIFICATION OF PATENTS

ISSUED JUNE 27, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

12 4,096,589
180 4,096,590

CLASS 4

111 4,096,592
231 4,096,593
255 4,096,597
326 4,096,591

CLASS 5

90 4,096,594
345 R 4,096,595
360 4,096,596

CLASS 8

1 A 4,097,229
2.5 A 4,097,230
41 D 4,097,231
65 4,097,232
83 4,097,233
94.19 4,097,234

CLASS 9

8 R 4,096,598

CLASS 13

32 4,097,679

CLASS 15

49 R 4,096,599
97 B 4,096,600
320 4,096,601

CLASS 16

85 4,096,602
110 R 4,096,603
128.1 4,096,604

CLASS 21

93 4,097,235

CLASS 23

230 B 4,097,237
230 L 4,097,236
230.3 4,097,238
232 R 4,097,239
253 TP 4,097,240
281 4,097,241
283 4,097,242
288 S 4,097,243

CLASS 24

70 SK 4,096,605
230 A 4,096,606
230 AP 4,096,607
249 R 4,096,608

CLASS 28

155 4,096,609
159 4,096,610
220 4,096,611
272 4,096,612

CLASS 29

156.8 R 4,096,614
4,096,615
157.3 A 4,096,616
278 4,096,617
4,096,618
413 4,096,619
428 4,096,620
526 R 4,096,621
578 4,096,622
580 4,096,623
596 4,096,624
4,096,625
624 4,096,626
628 4,096,627
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CLASS 30

152 4,096,629
258 4,096,630
294 4,096,631

CLASS 32

32 4,096,632

CLASS 33

1 SD 4,096,633
75 C 4,096,634
98 4,096,635
169 R 4,096,636
174 D 4,096,637
396 4,096,638

CLASS 34

10 4,096,640
15 4,096,639
4,096,641
57 R 4,096,642
122 4,096,643

CLASS 35

31 R 4,096,644
35 R 4,096,645
43 4,096,646
56 4,096,647

CLASS 36

32 R 4,096,649
50 4,096,648
120 4,096,650
4,096,651

CLASS 37

41 4,096,652
118 R 4,096,654
142 A 4,096,653

CLASS 40

2 R 4,096,655
564 4,096,656

CLASS 43

56 4,096,657

CLASS 44

1 R 4,097,244
23 4,097,245

CLASS 46

17 4,096,658
47 4,096,659
76 A 4,096,660

CLASS 47

58 4,096,661
70 4,096,662
80 4,096,663

CLASS 49

235 4,096,664
475 4,096,665

CLASS 51

7 4,096,666
99 4,096,667
101 LG 4,096,684
170 EB 4,096,668
309 R 4,097,246

CLASS 52

63 4,096,669
79.1 4,096,675
90 4,096,670
94 4,096,671
127 4,096,672
156 4,096,673
220 4,096,676
233 4,096,674
297 4,096,677
403 4,096,678
551 4,096,679
665 4,096,680
713 4,096,681

CLASS 53

149 4,096,682
244 4,096,683

CLASS 55

17 4,097,247
33 4,097,248
41 4,097,249
48 4,097,250
97 4,097,251
135 4,097,252
169 4,097,253
294 4,097,254
4,097,255
429 4,097,256

CLASS 57

34 B 4,096,685
58.95 4,096,686
157 F 4,096,687

CLASS 59

79 R 4,096,688

CLASS 60

39.63 4,096,689
282 4,096,690
295 4,096,691
307 4,096,692
337 4,096,693
459 4,096,694
517 4,096,695
547 4,096,696
599 4,096,697
641 4,096,698
657 4,096,699

CLASS 61

1 F 4,096,700
38 4,096,701
45 R 4,096,702
59 4,096,703
95 4,096,704
111 4,096,705

CLASS 62

115 4,096,706
167 4,096,707
275 4,096,708
307 4,096,709

CLASS 63

2 4,096,710

CLASS 64

13 4,096,711
26 4,096,712

CLASS 65

4,097,257
31 4,097,258
327 4,097,259

CLASS 66

121 4,096,713

CLASS 68

5 C 4,096,714

CLASS 70

59 4,096,715
63 4,096,718
139 4,096,716
248 4,096,717
450 4,096,719

CLASS 71

66 4,097,261
90 4,097,262
4,097,263
4,097,264
4,097,265
94 4,097,260

CLASS 72

50 4,096,720
60 4,096,721
104 4,096,722
123 4,096,723
132 4,096,724
250 4,096,725
291 4,096,726
312 4,096,727
345 4,096,728
350 4,096,729
352 4,096,730
405 4,096,731

CLASS 73

5 4,096,732
7 4,096,733
23.1 4,096,734
35 4,096,735
40 4,096,736
46 4,096,737
52 4,096,738
56 4,096,739
88.5 R 4,096,740
90 4,096,741
94 4,096,742
136 A 4,096,743
180 4,096,744
194 B 4,096,745
205 R 4,096,746
251 4,096,747
362 AR 4,096,748
425.2 4,096,749
425.6 4,096,750
4,096,751
431 4,096,752
432 R 4,096,753
4,096,754
598 4,096,755
609 4,096,756
621 4,096,757
718 4,096,758
731 4,096,759
738 4,096,760

CLASS 74

61 4,096,762
69 4,096,763
128 4,096,761
233 4,096,764
473 R 4,096,765
640 4,096,766
801 4,096,769
822 4,096,767
865 4,096,768

CLASS 75

0.5 B 4,097,267
0.5 R 4,097,266
57 4,097,268
58 4,097,269
68 R 4,097,270
104 4,097,271
119 4,097,272
121 4,097,273
201 4,097,274
203 4,097,275
208 R 4,097,276

CLASS 82

1 C 4,096,770
35 4,096,771
82 4,096,772

CLASS 83

8 4,096,773
478 4,096,789
511 4,096,775
552 4,096,774
698 4,096,776
762 4,096,777

CLASS 84

1.16 4,096,780
1.25 4,096,778
239 4,096,779

CLASS 87

28 4,096,781

CLASS 89

1 A 4,096,782
34 4,096,783

CLASS 91

6 4,096,784
416 4,096,785
499 4,096,786

CLASS 92

260 4,096,787

CLASS 93

39 L 4,096,788

CLASS 96

1.5 R 4,097,277
22 4,097,278
27 R 4,097,279
44 4,097,280
48 HD 4,097,281
73 4,097,282
115 R 4,097,283
126 4,097,284
132 4,097,285

CLASS 98

37 4,096,790

CLASS 99

353 4,096,791
355 4,096,792
467 4,096,793
494 4,096,794
4,096,795

CLASS 100

35 4,096,796
39 4,096,797
53 4,096,798
215 4,096,799

CLASS 101

110 4,096,800
227 4,096,801

CLASS 102

49.5 4,096,802
4,096,803
66 4,096,804
214 4,096,805

CLASS 104

12 4,096,806

CLASS 105

467 4,096,807

CLASS 106

1.11 4,097,286
14.14 4,097,287
21 4,097,288
26 4,097,289
30 4,097,290
38.9 4,097,291
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43 4,097,293
4,097,294
52 4,097,295
53 4,097,296
177 4,097,297
243 4,097,298
287.32 4,097,299
299 4,097,300
300 4,097,301
312 4,097,302

CLASS 110

244 4,096,808
271 4,096,809

CLASS 112

65 4,096,810
77 4,096,811
220 4,096,812
275 4,096,813

CLASS 113

120 A 4,096,815
120 M 4,096,814

CLASS 114

75 4,096,816
280 4,096,817
311 4,096,818

CLASS 115

17 4,096,819
41 HT 4,096,820

CLASS 118

10 4,096,821
48 4,096,822
4,096,823
100 4,096,824
221 4,096,825
656 4,096,826

CLASS 119

1 4,096,827

CLASS 123

25 J 4,096,829
32 EA 4,096,830
4,096,833
32 EE 4,096,834
32 EG 4,096,831
32 SP 4,096,832
52 B 4,096,835
90.15 4,096,836
119 F 4,096,837
139 AW 4,096,838
4,096,839
146.5 A 4,096,840
148 E 4,096,841
179 A 4,096,843
179 S 4,096,842
193 P 4,096,844
198 F 4,096,845
209 4,096,828
228 4,096,846

CLASS 126

61 4,096,847
120 4,096,848
121 4,096,849
271 4,096,850
4,096,861
350 R 4,096,851

CLASS 127

19 4,097,303

CLASS 128

2 A 4,096,853
2 H 4,096,852
2.05 T 4,096,854
2.08 4,096,855
4.19 D 4,096,856
84 R 4,096,857
145.6 4,096,858
213 4,096,859
214.4 4,096,860
348 4,096,862
349 R 4,096,863
354 4,096,864
419 PG 4,096,866
419 PT 4,096,865

CLASS 131

171 R 4,096,867
173 4,096,868

CLASS 134

3 4,096,869
6 4,097,304
4,097,305
10 4,097,306
4,097,307
28 4,096,870
40 4,096,871
105 4,096,872
135 4,096,873

CLASS 135

5 R 4,096,874

CLASS 136

89 H 4,097,308
89 PC 4,097,309
89 SG 4,097,310

CLASS 137

102 4,096,875
185 4,096,876
281 4,096,877
351 4,096,878
391 4,096,879
454.2 4,096,880
492 4,096,881
596.12 4,096,882
596.13 4,096,883
627.5 4,096,884

CLASS 138

97 4,096,885
99 4,096,886
117 4,096,887
125 4,096,888

CLASS 139

435 4,096,889
4,096,890

CLASS 140

1 4,096,891
140 4,096,892

CLASS 141

90 4,096,893
93 4,096,894

CLASS 145

29 R 4,096,895
50 B 4,096,896

CLASS 148

6.21 4,097,311
6.27 4,097,312
105 4,097,313
188 4,097,314

CLASS 149

2 4,097,315
4,097,316

7 4,097,317

CLASS 150

0.5 4,096,897

CLASS 152

330 L 4,096,898
354 R 4,096,899
4,096,900
370 4,096,901

CLASS 156

69 4,097,318
79 4,097,319
109 4,097,320
136 4,097,321
149 4,097,322
159 4,097,323
179 4,097,324
215 4,097,325
366 4,097,326
515 4,097,327
523 4,097,328
617 SP 4,097,329

CLASS 160

122 4,096,902
176 R 4,096,903
299 4,096,904

CLASS 164

51 4,096,905
433 4,096,906
448 4,096,907

CLASS 165

64 4,096,908
76 4,096,909
81 4,096,910

CLASS 166

234 4,096,911
259 4,096,912
290 4,096,913
307 4,096,914

CLASS 172

42 4,096,915

CLASS 173

137 4,096,916

CLASS 174

8 4,097,680
12 R 4,097,681
15 R 4,097,682
38 4,097,683
52 PE Re.29,683
68.5 4,097,684
4,097,685
131 A 4,097,686

CLASS 175

228 4,096,917

CLASS 176

19 R 4,097,330
81 4,097,331
87 4,097,332

CLASS 177

145 4,096,918

CLASS 178

68 4,097,687

CLASS 179

1 G 4,097,689
1 GQ 4,097,688
2 A 4,097,690
4,097,696
2 C 4,097,691
2.5 R 4,097,692
15 AT 4,097,693
4,097,694
15 BA 4,097,695
175.3 R 4,097,697

CLASS 180

6 R 4,096,919
11 4,096,920
121 4,096,921

CLASS 182

36 4,096,922
83 4,096,923

CLASS 184

58 4,096,924

CLASS 187

29 R 4,096,925

CLASS 188

71.4 4,096,926
268 4,096,927
282 4,096,928

CLASS 190

42 4,096,929

CLASS 192

4 A 4,096,930
18 A 4,096,931
48.91 4,096,932

CLASS 194

100 A 4,096,933

CLASS 195

33 4,097,333
51 G 4,097,334
51 S 4,097,335
99 4,097,336
100 4,097,337
103.5 R 4,097,338
142 4,097,339

CLASS 198

356 4,096,936
377 4,096,937
420 4,096,938
460 4,096,939
560 4,096,940
689 4,096,941
781 4,096,942
793 4,096,943

CLASS 200

61.27 4,097,700
61.45 R 4,097,698
4,097,699
153 LB 4,097,702
153 S 4,097,701
157 4,097,703
4,097,704
4,097,705
293 4,097,706

CLASS 202

241 4,097,340

CLASS 204

1 T 4,097,341
28 4,097,342
37 R 4,097,343
59 AM 4,097,345
59 R 4,097,344
80 4,097,346
109 4,097,347
157.1 H 4,097,348
158 R 4,097,349
159.23 4,097,350
181 C 4,097,352
181 N 4,097,351
195 S 4,097,353
206 4,097,354
228 4,097,355
237 4,097,356
252 4,097,357
270 4,097,358
297 W 4,097,359

CLASS 206

219 4,096,944
469 4,096,945
484.2 4,096,946
519 4,096,947
571 Re.29,678
622 4,096,948

CLASS 208

8 4,097,360
10 4,097,361
78 4,097,362
4,097,363
111 4,097,364
4,097,365
127 4,097,366
135 4,097,367
139 4,097,368
180 4,097,369
255 4,097,370
313 4,097,371

CLASS 209

3 4,097,372
74 M 4,096,949
111.5 4,097,373
121 4,096,950
379 4,097,374

CLASS 210

23 H 4,097,375
36 4,097,376
50 4,097,377
67 4,097,378
167 4,097,379
170 4,097,380
259 4,097,381
456 4,097,382
500 M 4,097,383

CLASS 211

207 4,096,951

CLASS 212

56 4,096,952

CLASS 214

1 BT 4,096,953
38 CC 4,096,954
75 G 4,096,955
82 4,096,956
145 R 4,096,957
152 4,096,958
302 4,096,959
505 4,096,960
510 4,096,961

CLASS 215

32 4,096,962
317 4,096,963

CLASS 219

10.55 B 4,097,707
10.55 R 4,097,708
4,097,709
69 D 4,097,710
76.15 4,097,711
107 4,097,712
121 EB 4,097,714
121 LM 4,097,715
121 P 4,097,713
137 R 4,097,716
147 Re.29,684
217 4,097,717
222 4,097,718
364 4,097,719
366 4,097,720
4,097,721
368 4,097,722
494 4,097,723

CLASS 220

3.4 4,096,964
20 4,096,965
69 4,096,966
269 4,096,967
314 4,096,968

CLASS 221

199 4,096,969
264 4,096,970

CLASS 222

1 4,096,971
135 4,096,972
146 HE 4,096,973
402.13 4,096,974
552 4,096,975
591 4,096,976

CLASS 224

5 BC 4,096,977
8 R 4,096,978
26 B 4,096,979
39 4,096,980

CLASS 225

99 4,096,981

CLASS 227

113 4,096,982

CLASS 228

122 4,096,983

CLASS 229

15 4,096,984
40 4,096,985
44 R 4,096,986
55 4,096,987

CLASS 233

23 A 4,096,988

CLASS 235

92 FL 4,097,724
92 MP 4,097,726
92 PK 4,097,725
307 4,096,989
4,096,990
382 4,097,727
419 4,096,991
439 4,097,728
462 4,096,992
467 4,097,729

CLASS 236

68 B 4,096,993

CLASS 239

57 4,096,994
94 4,096,995
406 4,096,996
413 4,096,997
533.3 4,096,998
533.5 4,096,999
593 4,097,000
658 4,097,001

CLASS 242

55.2 4,097,002
107 4,097,003
129.72 4,097,004
189 4,097,005
199 4,097,006

CLASS 244

3.11 4,097,007
118 R 4,097,008
129.5 4,097,009
158 4,097,010

CLASS 248

5 4,097,011
23 4,097,012
171 4,097,013
225.4 4,097,014
339 4,097,015
418 4,097,016
515 4,097,017

CLASS 249

105 4,097,018
204 4,097,019

CLASS 250

201 4,097,730
205 4,097,731
4,097,732
221 4,097,733
237 G 4,097,734
252 4,097,735
4,097,736
269 4,097,737
305 4,097,738
311 4,097,739
4,097,740
322 4,097,741
333 4,097,742
339 4,097,743
366 4,097,744
398 4,097,745
444 4,097,746
445 T 4,097,747
505 4,097,748
527 4,097,384
548 4,097,750
550 4,097,749
571 4,097,751

CLASS 251

10 4,097,020
214 Re.29,679

CLASS 252

32.7 R 4,097,386
47.5 4,097,387
49.9 4,097,388
51.5 A 4,097,389
60 4,097,390
62.1 L 4,097,391
62.62 4,097,392
78.3 4,097,393
79.5 4,097,394
106 4,097,395
132 4,097,396
153 4,097,397
162 4,097,398
182 4,097,399
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301.1 R 4,097,402
301.1 W 4,097,401
312 4,097,403
316 4,097,404
4,097,405
351 4,097,406
370 4,097,407
426 4,097,408
429 R 4,097,409
455 Z 4,097,410
457 4,097,411
465 4,097,412
4,097,413
476 4,097,414
501 4,097,417
512 4,097,415
522 4,097,416
531 4,097,418

CLASS 254

22 4,097,021
133 R 4,097,022
156 4,097,023
169 4,097,024

CLASS 256

1 4,097,025

CLASS 260

2.1 R Re.29,680
4,097,420
2.5 A 4,097,424
2.5 AK 4,097,422
4,097,423
2.5 AM 4,097,426
2.5 F 4,097,419
2.5 N 4,097,421
4,097,425
9 4,097,427
17 R 4,097,429
4,097,430
22 R 4,097,431
23 AR 4,097,433
23 XA 4,097,432
23.3 4,097,434
28 R 4,097,435
29.2 E 4,097,437
29.4 UA 4,097,438
29.6 H 4,097,436
31.2 N 4,097,439
31.4 R 4,097,440
37 N 4,097,442
38 4,097,443
40 P 4,097,444
40 R 4,097,445
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42.14 4,097,447
42.18 4,097,448
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42.21 4,097,450
45.7 R 4,097,451
45.75 N 4,097,454
45.8 A 4,097,587
45.8 N 4,097,452
45.9 P 4,097,453
47 CB 4,097,455
47 ET 4,097,458
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4,097,461
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47 UA 4,097,456
4,097,460
47 XA 4,097,457
57 A 4,097,463
62 4,097,464
75 EP 4,097,465
4,097,466
75 M 4,097,468
75 UA 4,097,467
78 A 4,097,470
78 R 4,097,469
112.5 R 4,097,471
122 4,097,473
139 4,097,474
157 4,097,475
173 4,097,476
239.57 4,097,477
286 R 4,097,480
293.77 4,097,481
294.8 C 4,097,482
296 H 4,097,483
299 4,097,484
306.8 D 4,097,485
4,097,486
326.27 4,097,489
326.45 4,097,490
326.5 C 4,097,488
326.85 4,097,487
332.2 A 4,097,441
340.7 4,097,491
343.3 P 4,097,493
345.2 4,097,492
345.5 4,097,495
345.8 P 4,097,494
4,097,496
345.9 R 4,097,428
346.71 4,097,497
346.74 4,097,501
346.75 4,097,498
347.7 4,097,499
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56 : 4,096,673

CLASSIFICATION OF DESIGNS

D1—	14	248,256		142	248,271	D11—	27	248,285		45	248,299		19	248,313		74	248,327
D2—	380	248,257	D8—	307	248,272		34	248,286		58	248,300	D24—	25	248,314		78	248,328
	383	248,258		331	248,273		83	248,287		76	248,301		39	248,315	D27—	12	248,329
D6—	56	248,259		354	248,274		125	248,288	D15—	32	248,302			248,316	D30—	41	248,333
	63	248,260		380	248,275		156	248,289		52	248,303		46	248,317	D34—	5 F	248,331
		248,261		499	248,276	D12—	59	248,290		127	248,304	D25—	48	248,318		5 MM	248,330
	79	248,262	D9—	207	248,277		102	248,291	D16—	02	248,305			248,319			248,332
	85	248,263		219	248,278		142	248,292		06	248,306			248,320	D56—	1 B	248,334
	149	248,264		222	248,279		146	248,293		59	248,307			248,321	D64—	18	248,335
	157	248,265		243	248,280		155	248,294		60	248,308			248,322	D87—	1 R	248,336
	183	248,266		275	248,281		206	248,295	D22—	7	248,309			248,323			248,337
	188	248,267	D10—	91	248,282	D14—	6	248,296		8	248,310			248,324	D92—	1 FF	248,339
	193	248,268		106	248,283		34	248,297		30	248,311			248,325		1 PP	248,338
D7—	28	248,269		109	248,284		41	248,298	D23—	7	248,312			248,326	D96—	12 A	248,340
	102	248,270															

CLASSIFICATION OF PLANTS

P.—	68	4,271		74	4,272		78	4,273						

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Juanita M. Kreps, Secretary

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Donald W. Banner, Commissioner